Industrial Finishing

Reg. U. S. Pat. Off.

An Independent Publication Devoted to the Finishing of Industrial Products

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H. L. Watrous
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Which brings drying time down so that it sands in twenty minutes, yet has remarkable building qualities and astonishing toughness though it does not pinhole nor orange peel.

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RUBBED EFFECT CLEAR LACQUER

Which don't pinhole, check or crack nor gray the film. Producing
a rubbed effect surface with depth of finish and speed of production that astonish you

Five gallons of each sent at the drum price
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Denny, Hilborn & Rosenbach, Inc.

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CHICAGO
NEW YORK
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From the Editor's Window

THE BUSINESS AND FINANCIAL report released September 30 by a large New York bank begins with the statement that, "A gradual spread of the recession in activity that was observed in some industries a month or more ago has characterized general business in recent weeks."

When production or capacity for production exceeds sales or demand, it is evident that more thought and effort have been devoted to volume production than to such vitally important factors as the quality, style and suitability of the product for present requirements—or perhaps to the sales promotion and salesmanship end of the business.

For example, a recent inquiry submitted to this office by a large retail paint store, states that, "Quite a few of our furniture dealers are having trouble with wax or cedar oil coming through on cedar chests having a cheap walnut finish on them. How should they go about to refinish these chests?"

Here is evidence of slighted quality in some manufacturer's misguided efforts to attempt low-cost volume production. What eventually happened has not built up goodwill, confidence nor prestige; instead it has built up future sales resistance by creating a certain degree of skepticism or prejudice among several furniture dealers and probably among many of their customers and friends against that manufacturer's goods, and also perhaps against cedar chests in general and particularly those finished in walnut color.

Proper preparation of the surface before finishing, plus the use of suitable quality finishing materials and correct methods of application would have created an entirely different situation. Sales forced by cheapness are not good sales.

O. H. Rohr

Managing Editor

LACQUER

Amerilac 109 Sealer

Seals, fills and dries to sand in thirty minutes.

Its ease of application, toughness and resistance to lacquer solvents makes Amerilac No. 109 Sealer an ideal undercoat or foundation for lacquer.

Try It

The American Varnish Co.

High Grade Varnishes, Pyroxylin Finishes
Stains, Fillers and Enamels

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HASKINS Equipment in operation at Reo Motor Car Co., Lansing, Mich.

This Method of Polishing Surfaces Speaks for Itself

A contract you had bid on failed to materialize? Why? Was it a matter of price? Or did some other shop offer a quality of work superior to yours?

Very likely the solution of your problem is to be found in HASKINS Flexible Shaft Equipment. Here is equipment that virtually produces business for its owners. The time necessary to complete a job is shortened—which is a saving. Output increases—which means a larger profit. Overhead is reduced—which makes a lower bid possible.

Increased output! Reduced overhead! More business! *Why do without HASKINS equipment when you can do so much more with it?* And remember, there is a HASKINS for every kind of work. Tell us your needs and we shall be glad to tell you how HASKINS meets them.

Haskins S R A-5 Equipment

HASKINS Equipments are used for Polishing, Rubbing, Sanding, Grinding, Brushing, etc.

R. G. HASKINS COMPANY

Portable Flexible Shaft Machinery

4647 W. Fulton St. Chicago

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Try this rapid drying Sealer.

It's W-Seal Brevolite...dries in less than 30 minutes. Prevents lacquer solvents from bleeding filler and stain, and requires no thinner for spraying. Makes ideal foundation for subsequent lacquer coats, with necessary depth and lustre to satisfy customers demand.

Use W-Surfacer under lacquer enamel finishes on wood or composition. It fills rapidly, sands easily and can be thinned to brush or spray consistency. One coat of W-Surfacer fills perfectly.

For your lacquer requirements try Brevolite Lacquers and Lacquer Enamels, or the new popular Brevocrakles.

Write for samples and particulars on using W-products to improve your finishing and reduce costs.

WAUKEGAN CHEMICAL
"Values that Endure"
COMPANY
Waukegan · Illinois

Spraco Guns

save

In actual tests conducted in the plant of an Ohio company, an operator using different makes of guns using the same lacquer and spraying identical pieces—turned out 20% MORE WORK with the Spraco Gun than with any of the others—and laid on a smoother finish.

Another user writes, "We are using 4 of your guns, have compared them with two other types of guns and FIND YOURS TO BE FASTER in operation and equal in quality of work."

Requiring only moderate air pressure, Spraco Guns deliver a fine, uniform spray that is "wet" its entire width and will not split. Drift, caused by an excessive volume of air at high pressure is eliminated; MATERIAL ordinarily blown through the fan as dry mist is SAVED.

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Power necessary to operate a Spraco 14-A Gun (45-65 lbs. per sq. in.: approximately 6 cu. ft. of air per min.) is considerably less than that required for other guns using higher pressures and a greater air volume. The low air volume consumption of Spraco Guns SAVES MANY POWER DOLLARS in the course of a year—permits more guns to be operated on your present equipment.

Simple to adjust, operate and clean, Spraco Guns have many advantages not found in ordinary guns. Write for Bulletins giving complete description of guns, tanks, booths, compressors and all necessary accessories.

116 Central Street Somerville, Mass.

3372

SPRUANCE QUALITY

Watch how this pyroxylin base Lacquer Sealer sands off

A lacquer sealer should not powder too readily under the sandpaper - - that is the first indication of lack of substance and durability.

SPRUANCE QUALITY PYROXYLIN BASE LACQUER SEALER

proves by its action under sandpaper - - or by any other test - - that it is the ideal foundation for subsequent coats. It has the substance that prevents cutting through, and is a body builder that in many instances has eliminated a coat. It has speed of drying, easy sanding qualities, levels out smooth and does not plug the paper; like all Spruance finishing products, it is built on a practical knowledge of the furniture builder's requirements. A single test will prove that it will produce a perfect undercoat for lacquer or varnish finish.

A five gallon sample will be sent on request at the drum price.

The Gilbert Spruance Co.

Manufacturers

Wood Finishing Products

Philadelphia, Penna.

"A Finish for Every Purpose"

Paasche Standardized "explosion-proof" airfinishing booths are suited for every need and purpose.

Paasche

AIRFINISHING FACTS

*Saved $130.68 per week
Increased production 300%
Paasche Equipment Cost $268

FOUR times as much painting done per day, plus saving of materials formerly wasted, plus a better looking, more even application of paint, are the direct results of using Paasche airpainting equipment on this job. The complete equipment was paid for out of savings in twelve working days.

Let us show you how much you can make by laying aside the old paint brush. Facts and figures that apply to your work are ready and waiting for you. When you figure costs and profits you will see why so many progressive manufacturers are making more money with Paasche equipment.

Paasche airpainting equipment offers you a standard, perfected line of equipment—adaptable to the widest range of work. With the multiplehead airbrush you are equipped for anything—ready to do any kind of job and do it right.

**A Paasche representative will gladly supply complete details.*

The Paasche airrubbing machine gives 1600 hand strokes a minute. You get a smoother finish, faster work, less fatigue and more uniform results. It will cut those sanding and rubbing costs. Send for bulletins.

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Handle in 30 minutes

Pack in two hours . . .

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B. L. P. Semi Gloss Dipping Enamel:

This enamel drains freely without piling up at ends, and gives a uniform satin finish that covers solid with one coat. May be reduced 20% with benzine.

B. L. P. Stain Lacquers:

Used for drawer interiors, etc., on the best furniture, as well as for novelty pieces. Gives a smooth rich non-porous film that shows the grain of the wood. Old Rose, Walnut, Brown, Mahogany and all wanted colors. Stain Lacquer may also be used over oil or water stains to enhance effect of depth. Thin with benzine or naphtha for spraying.

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Incorporated

LOUISVILLE Pee Gee KENTUCKY

Since 1867

VARNISH • LACQUERS • STAINS • ENAMELS • FILLERS

Model PX

A portable unit especially designed for continuous service in Spray Painting. Non-automatic. Equipped with suction unloader for 80 lb. to 90 lb. continuous service; also air filter, 14" x 30" tank. Single V-Belt.

PX-1—½ H P., 4.2 cu. ft. displacement.

PX-2—1 or 1½ H. P., 6 or 8.6 cu. ft. displacement.

Painting Economy

A Quincy Compressor Unit will actually save you real money--

1st—In power economy. Quincys were always power savers, but the recent adaption of the V-Belt drive effects an additional saving, by actual test, of *20% to 30%*.

2nd—In low upkeep. Quincys are so well designed and made that repairs are negligible. And when they are required, easy accessibility keeps down the cost.

3rd—In long life. Due to superior design, construction and inspection, a Quincy will last *longer than you expect it to*.

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The sensational new product you've been waiting for—Has better body than lacquer . . . . 2 coats being equal to 3 coats of lacquer . . . . you can maintain same production schedule with it as with lacquer . . . . at 50% lower cost.

Spray one coat—follow in two hours with second—rub next morning.

Dries dust free in 10 to 15 minutes.

Its hardness is unusual considering its elasticity.

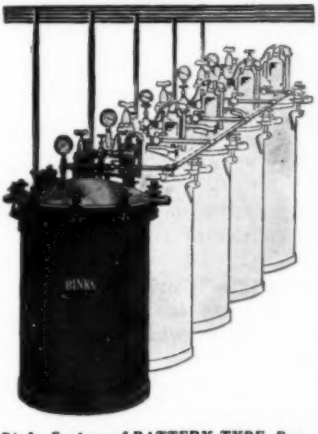
Positively will not print.

We are also makers of high grade lacquers but we particularly recommend this new varnish as something very unusual and different. Send today for sample or trial order.

Indianapolis Varnish Co.
131-147 NORTH PINE ST.
Indianapolis, Indiana.

Separate Air and Material Control With Air - Motor Agitator.

REMOVE GUESSWORK
— and You Remove Waste!



Binks System of BATTERY TYPE Pressure Containers conveying Finishing materials by means of piping from paint storage room to Spray Booths installed in large production plants.

Material fed to the gun from Binks Pressure Containers never varies in its flow. When Binks double-dial control is used, you not only secure positive control of the material flow to the gun, but the air pressure is controlled *separately!* Dependable air pressure you can regulate to the finest atomizing pressure to the spray gun. Different finishes require different materials — and different materials require different atomizing pressures. Now you can control that too!

Agitation is Important. Do not make your operator stop spraying to "stir" material. That costs too much - - it is not dependable. The Air-Motor Agitator keeps material agitated in a uniform consistency. Every ingredient is effectively proportioned - - every color pigment is uniformly distributed. The flow never varies - - the color never changes! Remove guesswork and you remove waste. Write us today for "Bulletin 59."

BINKS MANUFACTURING CO.

Neil C. Hurley, President *J. F. Roche, Vice Pres.*

3001 Carroll Ave., Chicago

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Now . . .

WORTHINGTON
Horizontal Compressors
. . . 6-inch and 9-inch stroke

COMPRESSOR users will readily appreciate the significance of this announcement . . . it means that they can now have the reliability and efficiency of Worthington Feather Valve Compressors in combination with the economy, carefree operation and other well-known advantages of Timken Roller Bearings.

This equipment is available in sizes employing 6-inch and 9-inch stroke, in capacities of 100 to 300 cu. ft. per minute.

The adoption of Timken Bearings is evidence of Worthington's policy of incorporating, in all of its products, those features of construction which mean increased satisfaction to the user.

If you are not familiar with Worthington Compressors and their numerous features of advanced design, ask the nearest branch office for full information.

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R-31

No business worries cloud the enjoyment of crisp, bracing days in the open for the finishing foreman who knows that his lacquer contains Butanol-solvents. « Butanol-solvents banish finishing troubles and guarantee economical, smoothly-running operations.

COMMERCIAL SOLVENTS CORPORATION

New York, N. Y. Terre Haute, Ind.

Beauty
Quality
Endurance

That rare combination of properties, found in Pe-Co-Lac Pyroxylin Lacquers, means that fine furniture may be beautiful and at the same time wear-proof. It means that toys may be finished for brutal treatment and still have the gaiety childhood craves. It means that the whole range of color combines with perfection of texture in a time-defying finish. We will gladly supply a sample.

FINISHED WITH PECORA PE-CO-LAC THERE'S NOTHING BETTER

Pecora Paint Company

3rd and Sedgley Streets

Philadelphia, Pa.

Established 1862 by Smith Bowen

Incorporated 1911

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Curtis Paint Spray Compressors

Stationary or Portable Types

The best safeguard against oil in the supply line is stop it at the source—

That's what the Curtis Centro-ring oiling does

It is easy to understand why practically every manufacturer of paint spraying equipment has standardized on Curtis Air Compressor units for this work.

Regardless of good lacquer, skilled workmanship, or even efficient spraying apparatus, a 100% job cannot be done if the compressor unit does not deliver a dependable, even flow of clean air, free from the slightest taint of oil.

Curtis Compressors provide the surest safeguards against oil in the supply line through two patented exclusive features of design.

The Curtis patented centro-ring oiling system delivers the exact amount of oil needed to working parts. No excess in the discharge line.

The Curtis unloader operates on the suction valve so that when the machine is unloaded the valves do not operate as with a suction port unloader, which creates a vacuum and pumps oil.

A detailed explanation of this new Curtis development can only be given in a catalog but it is so important to justify anyone in getting the complete facts now.

Mail coupon for catalog describing this vital feature and the many sizes of Curtis Timken Bearing equipped compressors used for paint spraying in both stationary and portable types.

CURTIS

CURTIS Pneumatic Machinery Company *St. Louis*

Curtis Pneumatic Machinery Co.

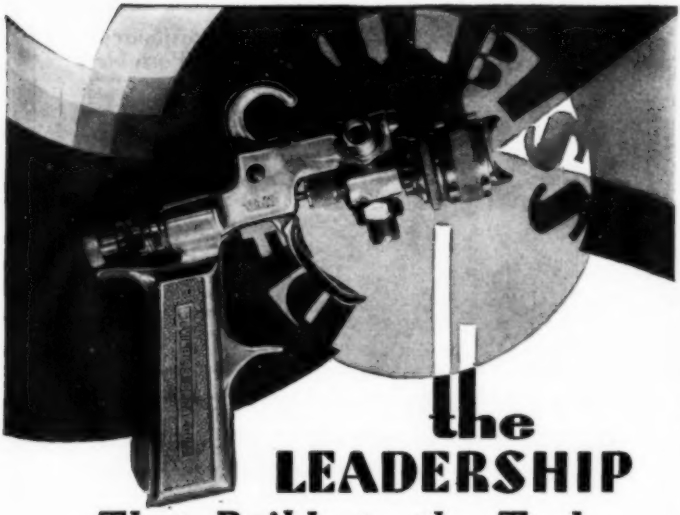
1977 Kienlen Ave., St. Louis 5518D Hudson Term., N. Y.

Curtis Paint Spray Compressors

Curtis Rotating Lift

Curtis Compressed Air Car Washer

Check items interested in, write name and address in margin and mail



the LEADERSHIP

That Builds to the Task

THE whole effort of the DeVilbiss organization is concentrated upon the manufacture of spray outfits which will best do the work for which they are intended, and be available at the lowest possible price.

The thoughtful purchaser concentrates his attention upon efficiency in use first, *because even a slight inefficiency in the spray outfit may result in the loss of economies and advantages infinitely greater than any price difference.*

Your manufacturing cost, selling cost, and profit depend to a large extent upon the cost and character of your finishing operation. Let us tell you what specialized DeVilbiss spray outfits will do to make your business better.

THE DEVILBISS COMPANY

294 Phillips Ave., Toledo, Ohio

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DeVilbiss
Spray-PAINTING FINISHING System

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Windsor, Ont.

Direct factory representatives in all other territories

Kindly mention INDUSTRIAL FINISHING when writing advertisers

This article gives some idea of what a tremendous list of materials and supplies are required in the modern finishing department, how to select and purchase them, when and where to buy and why

By M. M. Miller

THE VARIED ITEMS that need to be purchased for the up-to-date finishing department—even though the plant is a small one—makes an imposing list, and to properly purchase these items with careful thought and to the best advantage, carefully weighing utility with quality and price, is no easy matter.

It has often been said by purchasing agents of large plants that the buying of the finishing materials taxed them the most, for the following reasons: The quality of materials cannot be easily recognized by examination; the test of time involves a long drawn out procedure that doesn't allow prompt decisions; analysis is expensive, often misleading and of no use if not kept up regularly by simple testings; and last but not least, every salesman of finishing materials seems to honestly believe that his product is a do-all, cure-all, eliminator of all difficulties for finishing problems of any nature.

From A to Z

The list of materials veritably goes from A to Z—from Alcohol to Zinc—with many elaborations in between, and to really cover all of them would cause this magazine to assume the proportions of an encyclopedia. However, there are high spots, and these I shall endeavor to hit.

Alcohol—the kind we use being CD No. 1, 190 proof—is now fully controlled as far as price is concerned. We buy in the early spring and contract for our requirements for the remainder of the year, to be taken out as we desire, the number of barrels taken at one delivery affecting the price.

Colors; Stains; Oils

I will pass over the various chemicals we use, such as oxalic acid and sodium bisulphite which are used for bleaching stains; also ammonia, hydrochloric acid, nitric acid and sulphuric acid, and various other chemicals we use.

Colors run the gamut from browns to yellows without an end to the variations between, and we find with these that it is best to connect with some dependable manufacturer whose colors will remain uniform from year to year.

Stain powders are many and varied, and to buy these only on a price basis is to run the risk of buying adulterated products. The real test of the various powders is the quantity of powder and the labor required to match a certain color, together with its permanency and durability.

Oils, of course, are a part of every finishing room and of these, besides linseed oil, we use oils of citronella, lemon, hemlock, cedar and sassafras. These latter oils are used as cleaners and polishers, and the amount used is small.

Rubbing oil is contracted for once a year and every large oil company will put out a fair product. Competition is keen and in the East one should not pay over 15 cents per gallon. This, of course, does not apply to de-bloomed rubbing oil, but we have not found it necessary to use this oil. A regular rubbing oil of a paraffin base will not cause much trouble in the way of blushing if a good grade of lacquer is used. This blushing, of course, is affected by so many other factors such as moisture, humidity, method of spraying, rubbing, etc., that one should be careful that all other adverse influences are corrected before beginning to experiment with different rubbing oils to avoid blushing or blooming.

Lacquer Materials

The buying of lacquers, reducers, lacquer enamels, and undercoats is not a simple matter—not with today's keen competition and the willingness of some manufacturers to meet the price—with inferior goods. We started buying lacquer at $2.75 per gallon. Competition for our business knocked the price gradually down to $1.40, and at this price we found we had our most trouble. We are now getting an excellent lacquer at around $2.00, and feel we are getting the proper quality lacquer at the right price.

It will be found best to buy both lacquer and lacquer thinner or reducer from the same concern; otherwise there may be solvents in one that will be detrimental to the other. Never attempt to use benzine, denatured alcohol or naphtha as lacquer thinner; the results will be disastrous.

The problems of lacquer enamels are those of lacquers, except with the addition of the pigments used. These pigments should be specified as *finely ground*, thoroughly incorporated in the lacquer, and they should be as nearly fast to light as possible.

Varnishes; Other Materials

Varnish is an old product and usually well-known by the experienced buyer. Other items which can be passed over are:

Fillers; Be sure these are made for use under lacquer.
Paints.
Pumice Stone.
Rubbing Felts.
Rosins; Very useful in making patching cements.
Wax.
Whiting.
Turpentine.
Vinegar; for cleaners, polishers, etc.
Shellacs.
Beeswax; for patching cements.
Benzine; for use with fillers. Many oil companies are now putting out products as satisfactory as benzine, cheaper, and not as volatile.
Benzole; for varnish remover.

Besides the above there is a large list of supplies which includes:

Rags; for straining and wiping.
Bottles.
Brushes.
Cans, etc.

It would be too easy to discourse a full page on each item covering the problems involved, and there are also dozens of articles which I have not mentioned.

There is enough to know about every item so that the intelligent buyer sees no end to what he can learn in order to be able to buy the best possible article for its particular purpose, for the best possible price.

Beautiful Woods Shown in Radio Cabinets

Superb workmanship plus careful matching of woods is one of the outstanding features of the new 1930 radio receiving sets exhibited recently at the Rochester, N. Y. radio show.

Simplification is the most noticeable thing this year, not alone in the panel arrangements, but in the design of the whole receiver. The advent last year of the single-dial system has made this feature practically essential in the new models for 1930. Some manufacturers have gone so far as to combine tuning control, volume control and the on-and-off switch into one knob.

The receivers for this season are typically furniture, greatly appreciated by the feminine visitors. It would be hard to say which receiving set is the most beautiful; all are simply magnificent, displaying the highest type of the cabinetmaker's art. Of course there is a wide range of types, shapes and sizes, and those representing the period designs are shown in large numbers. It is safe to say that this year there are more beautiful sets than ever before, so far as selection of woods and the matching of grains and the general excellence of workmanship and finish are concerned. Greater precision in manufacturing is quite noticeable.

Radio manufacture today has approached the artistic from the cabinetmakers point of view. A feature of this display is the beautiful craftsmanship which is now so necessary to a quality radio set. Radio consoles are built with the idea of developing a piece of furniture that will grace any home.

While a wide variety of woods are offered in this display, walnut seems to predominate; for example, walnut with maple overlays, surfaces veneered with matched butt walnut, walnut burl overlays front and back; panel centers in matched butt walnut, tops of butt walnut, sides in full diamond-matched veneer with insert carvings—all splendid examples of modern woodworking.

Two cabinet models of the early American style—a highboy and lowboy Sheraton model—are finished in antique handrubbed walnut and ornamented antique brass escutcheons. These are designed to fit in with furniture of early Colonial days. Countless other finishes, woods and designs are available.—A. J. Owen.

Progress brings new forms of competition to be faced.

Blue Knight Recruits Saber Champion

The Roxalin Flexible Lacquer Co., Inc., is pleased to announce the addition of Norman Cudworth Cohn A.B., B.S., Ch.E., to its technical staff. Mr. Cohn received his degree from Columbia University. Since 1926 his sword arm has been winning bouts for his Alma Mater. In 1928 he was sent to Holland as a member of the United States Olympic Saber Team. Just recently he was proclaimed the National Outdoor Saber Champion, and now he joins the Blue Knight to joust for further victories.

Lacquer Finishing on Sheet Steel

Foreman Finisher relates his experience with different types of primers and surfacers under lacquer finishes, giving the complete metal cleaning and finishing process in each case

By E. B. Smethers

IN FINISHING METAL with lacquers, various systems and materials are used. In practically everything but the very cheapest article a primer is generally applied to form a bond between the metal and the one or more coats that follow. In some cases surfacing coats are applied to fill imperfections in the metal and to permit rubbing to obtain a smooth surface—the number of coats depending upon the condition of the metal and the quality of finish desired.

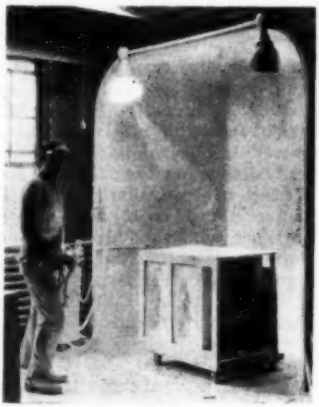
At this writing I will only discuss an article, constructed of sheet steel, that is finished in a white lacquer enamel and used for interior purposes. Many test panels have been made with various systems and types of finishing materials, the best (in my judgment) being put to practical use and applied in our plant on a productive basis.

Baked Finishing Primer

A primer, when properly constructed, applied and baked, is (I believe) the best type for use under lacquer enamels. Such a primer or surfacer withstands the solvent action of the lacquer, rubs easily to a smooth surface, is reasonably elastic, and adheres perfectly to the metal. Being thoroughly oxidized by the baking process, no rapid changes will result after the finishing process.

Air-Drying Primers

Although air-drying paints are not considered as good as the baked finishes—and of course rightfully—very good results have been obtained with some of those purchased from reliable manufacturers. Such undercoats are more apt to soften under lacquer, are not quite as tough and elastic, and will not adhere to the metal quite as well. It might be stated at this time that from tests of several primers and surfacers finished with lacquer enamels, it has been found a very good policy to use the complete system of one manufacturer.



Although the undercoat of a certain manufacturer may not soften or give any trouble under his brand of lacquer, quite the reverse may occur if another lacquer is used. Also these undercoats, especially the primer, should be made for use under lacquer. Some of the old type primers and surfacers will give good results, but the possibility of danger is much greater than where materials have been constructed for this purpose.

As was stated previously in this article, air-drying undercoats are, in my opinion, inferior to the baked type; nevertheless excellent results are being obtained in our plant with this type. The primer we are using has proved to be very elastic, adheres firmly to the metal, air-drys at 80-deg. F. overnight and is not softened or raised by the solvent action of lacquer. We are obtaining a durable and good looking finish by the following process:

Cleaning; Rinsing

The metal surface is first dipped in a boiling solution of cleaning material, then rinsed in a cold water dip, and dried in a boiling water dip.

The metal is sprayed with white oil-primer as soon as possible after being cleaned, all handling being done with rubber gloves. The primer is given an overnight dry, being scuffed lightly with No. 5/0 garnet sandpaper in the morning.

In cases where the metal is perfectly smooth and free from rust, no surfacer is applied. Then two coats of a white lacquer enamel are applied with a spray gun, allowing at least two hours between coats. An excellent white opaque finish is obtained in a two-day schedule; and practical use and tests have proved it to be durable.

Lacquer-Base Primer

A third type of primer, which has been used quite extensively in our plant, is of the nitrocellulose lacquer base type. This has been tested and put through on a productive basis at various times since it first became available over five years ago. Speed is its greatest single asset.

A great many of the units just described have been finished with a complete lacquer system and put into service. Just recently I saw a number of these that had been in service for the past four years, during which time they had been subjected to very severe wear. In most cases the finish had held intact, but in a few instances it had chipped in small spots from the metal.

Upon investigation it was found that some of these articles had been used for display bins from which it was necessary to remove the merchandise with a sharp scoop. The sharp point of this scoop has punctured the lacquer film, the finish popping from the metal because of its brittleness. The lacquer itself had a very hard surface, but when struck with a sharp instrument, it would pop loose. A hard blow with a blunt instrument did not affect it.

Of course, in my tests I had learned of this characteristic, but I had not expected the finish to receive such treatment. At any rate the pyroxylin primer has been discarded in favor of the oil-base type, and with very gratifying results. Constant development work is being done on lacquer-base primers and great improvements are bound to result.

The Surfacing Coat

For the surfacing coat it is also a question of whether to use a lacquer-base or the oil type of

finish. I use both, but when time permits, (more time for drying) I give preference to the oil-type surfacer.

As I see it, the only disadvantage in the pyroxylin undercoat is that it doesn't fill the imperfections in the metal quite as quickly and effectively as an oil surfacer, and it requires a little more rubbing to obtain the desired surface. As far as durability is concerned, it is a toss up which to use.

The oil-type primer and surfacer have proved to be the cheapest in regard to material cost; especially is this true for the priming coat. Careful checks on runs of several hundred units has resulted in showing a coverage of 336 units per gallon of the oil primer, as compared to 224 units per gallon of the lacquer base material. Price per gallon also favors the oil-type material slightly.

Wet Sanding

The smoothing is done by rubbing with No. 220 and finishing off with No. 280 Wetordry sandpaper, using plenty of water and keeping the paper clean by frequent rinsing in clear water. When the desired degree of smoothness has been obtained, the surfaces are given a thorough washing with clear water and allowed to dry. Any bare metal spots are touched up with the primer at this time and, after drying, these touched-up places are sanded lightly with a fine grade of finishing paper.

Two coats of lacquer enamel are now sprayed on, allowing at least one hour for drying time between coats. As the natural velvet luster of lacquer is more desirable than the highly-polished rubbed job on this class of work, the bin is ready for shipment a few hours after the last coat has been applied, without danger of being marred by any scratching or sticking of the finish.

Smoothness Without Rubbing

To obtain the maximum smoothness without rubbing, a very good grade of lacquer enamel is used and only the best of thinner, as recommended by the manufacturer. In my opinion there are two grades of lacquer enamel—high-grade and cheap. The former is used on our bins, as a smooth lustrous film is desired—one which is hard and durable—and because of the choice of pigments and their fineness, the best coverage is obtained.

The cheap lacquer enamels which must contain the cheap pyroxylin of high viscosity, or scrap film, and which are thinned with cheap solvents and plasticisers, and which contain pigments that lack the firmness of grinding (appearing harsh and feeling rough to the touch)—these are not at all pleasing to the eye in comparison to the high-grade enamels.

One of the sales difficulties in industrial salesmanship is that in calling on the purchasing agent or superintendent, the salesman often fails to meet the worker who actually uses the product, and who very often dictates the kind and brand of the goods he wants.

J. M. Thomas to Represent James B. Day & Co., in South

James B. Day & Co., (mfrs. wood finishing materials), Chicago, Ill., announces the appointment of Mr. J. M. Thomas to its sales organization. Mr. Thomas will represent the company in North Carolina and Virginia.

GLASSWARE FINISHING

Revealing some interesting information about the process of applying and "fixing" color finishes and color decorations to a variety of articles included in modern glassware; also the imparting of other decorative effects to glassware

By H. A. Donaldson

IN THE REALM of industrial finishing, many of us are apt to think only of the attractive exteriors on automobile bodies, furniture, and that great line of household goods sold on partial payments, starting with the radio and ending with the more humble kitchen appliances. Color and finish have changed these products from things to be bought when needed, to things the public is eager to buy immediately.

But there are other lines in which the plain drab natural finish of the material itself has given way to modern finishes of the kind sure to stimulate the buyer's "finish conscious" nerve centers. Glass products constitute a line which is fully up-to-date in the matter of finish, variety, color and trend. For example, in going through the plant of Gillinder Bros. at Port Jervis, N. Y., the writer noted clear glass steamer lights and iridescent globes that are given no further treatment, frosted-finish goods, shades with crackle finish, and a variety of vessels on which decorative designs are applied by more or less conventional coating methods.

Various Processes Involved

A trip through the plant shows that glass products do not rely upon one kind of treatment for finish effects but may partake of thermal, chemical, and mechanical processes in addition to the effects realized solely through scientific combination of ingredients. Colors in the glass itself are practically all obtained by the use of metallic oxides. In clear glass work, the public prefers a greenish tinge to a pink, but both of these may be secured through elementary compositions and are discernible to the lay eye when a piece is fractured.

Sand-Blasting; Acid Dip

Globes for electric light are made opaque in several ways. Sand-blasting is a common method and one that follows closely the use of this quick-covering process in preparing metal surfaces for painting, and castings for particular customers. At Gillinder's, the "booth" in which globes are placed for frosting is about 3-ft. square and the clear blown glass is set down inside.

A softer appearance than the frosting secured by sand-blasting is produced through an acid dip. Naturally, this work must be separated from other processes because of the far-reaching effect of acids in open tanks and in handling. Tanks resembling those used for electro-plating are filled with a solution of hydrofluoric acid (steam heated) into which the containers are immersed.

Crackle Finish

An interesting process, in which a glue acts as the re-agent

in producing a crackle type of finish, has to do with glass articles that are painted with this glue. As this glue dries, it peels off portions of the surface glass with it, leaving a finish that follows no regular pattern but which is most effective from the very irregularity revealed.

The above treatment resembles a crackle finish but the indentations are deeper and more akin to the tooling of an engraver. The glassmaker's crackle finish is the child of heat treatment entirely. The vase or shade, while still at a red heat, is dipped into a tank of water bringing about a shock that checks the surface most sharply, but this does not act severely enough for the cracks to go clear through. Later, these same articles are re-heated by the use of specially-shaped fixtures which send a fusing flame against the checked surface to blend the sharp edges into those rounded ones found when the goods reach dealers' shelves.

Applying Decorations

Decorations of various kinds are applied to glass in a manner quite similar to that used on wood surfaces. Articles are sprayed, designs are transferred on to them, stencils are used, and some hand work is included. As might be expected, girls have more of a gift for this work than men. Small booths, in which cast-iron turntables hardly more than a foot in diameter are found, are arranged along the finishing room, and the decorators sit before them.

Stenciling

On quantity work, metal patterns are made up in skeleton form to be used like stencils where the color effects are secured in the open spaces. Sheet iron, copper, or cast-iron may be used for the pattern. Often, a simple casting with cut-outs will suffice; a shade on which imitation ribs are painted will be an almost complete covering, broken only by the radial slots. Artists' air brushes about 3-in. long and hardly bigger than a fountain pen are used by the decorators to produce stripes and other delicate tracings which would do credit to the most skilled hand-brush artist.

Transferring

An interesting process that bears considerable resemblance to what is known as "offset" printing is used in the decoration of pieces made in smaller quantities. A color is applied to the raised surface of an engraved bench plate and taken off of this on a paper sheet, as in forms of typographic printing. This paper is applied to the glass article where the paint is transferred to the smooth glass surface. Later, the articles are fired at temperatures between 900 and 1100-deg. F., and the paint is permanently affixed.

Fixing By Firing

In order to fix decorative designs to the surface, or cause them to enter the glass slightly, all such work is put through what average finishers would call a "baking" process. The term "firing" is the glass and ceramic substitute for this final heat treatment. Some work is fired in a kiln and some in a leer, which is a long oven with chain floor and the heater at the center.

Forming Inside Corrugations

Although not exactly a finishing process, the way in which corrugations are formed inside glass

For a *greater* margin of *profit* and a *deeper* cut in finishing *costs*—furniture manufacturers *have* accepted

The New and Improved

SANDING SEALER No. 2550

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Last month we modestly predicted that the superior performance of our new and improved Sanding Sealer No. 2550 would make further drastic cuts in finishing costs

What our exhaustive laboratory tests indicated has now been definitely proven in actual service • • • • •

Immediate acceptance by the trade and their enthusiastic praise for this new and better Sanding Sealer once more emphasizes the acknowledged leadership of Zapon in bringing to manufacturers, as a result of vast facilities and tremendous resources, products of incomparable merit • • • • • • • • • • • • • • • • •

If you are seeking even greater profits through reduced finishing costs, consider these proven facts • • • •

Zapon new and improved Sanding Sealer No. 2550 costs less than good shellac and dries in less than ⅓ the time without bleaching the filler. One coat fills perfectly. Cuts sanding costs in half. Sprays easily. The best base for lacquer. Insures perfect adhesion and is free from grayish cast • • • • • • • • • • • •

Generous sample with full instructions sent on request

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articles is apropos because this treatment acts as a lure to the buyer as surely as does color alone. Aquariums, table glassware, fixtures, and so forth are frequently made smoothly round on the outside but with vertical or diagonal corrugations on the inside. Every man of mechanical turn of mind has asked the question, "How are those ridges made?" He is particularly interested when the ridges run diagonally or when the vessel's mouth is smaller than its body, wholly precluding the withdrawal of a male former.

Such articles are first blown in a mold that is a little smaller diametrically than the finished size. This mold has its inner wall corrugated in the same manner as the final finished article, and this shape is imparted to every piece blown therein, but the corrugations are on the *outside* of them. With diagonal ridges, the glass blower carefully unwinds the article as he withdraws it by giving his pipe a helical motion also.

While still in hot, plastic state, the same article is placed in the final mold, which is a little larger around and perfectly smooth. Here, the air pressure applied is not great enough to iron out the glass to uniform wall thickness, but it is sufficient to flatten out the exterior wall to fill the smooth mold. In the bending that thus takes place, the corrugations are, in effect, transferred from the outside to the inside, where they remain to attract the gaze of buyers.

Factories like that of Gillinder Bros., which cater to a broad line of commercial work, are not thought of as finishers in the usual sense, but finishing is really a major process from start to finish and it may even demand far more skill and variety of material than the underlying process of glass making. Where foundries and machine shops are combined, the common appellation for the business is "the foundry," even though the finishing processes are what draw the buyers, even as in the manufacture of glass goods.

There is no excuse for unclean edges of color when masking, except perhaps, carelessness.

Paasche Announces Larger New York Branch

Paasche Airbrush Co. announces, effective October 1st, larger and more modern quarters for its New York Sales and Service branch to be located at 103 Lafayette St., New York City—Telephone Canal 4763-9.

"The largely increased demand for Paasche Airdevices in the Eastern territory made necessary this splendid ground floor location close to all subway stations, which can be conveniently reached from all inner-city points."

Mr. L. J. Dagon continues as Branch Manager, assisted by Messrs. H. A. Schwarz, Louis Straub, P. R. Ford, and G. M. Theuret, a competent office force and with the added facilities of this larger and better office, the service rendered by the New York Staff of the Paasche Airbrush Co., will set new and even higher standards for Paasche customers in Connecticut, Rhode Island, New Jersey and New York. A complete stock of Paasche Equipment will be constantly maintained at this new address.

Hildreth's Philadelphia Distributor

The Hildreth Varnish Co., Inc., (fine varnishes, lacquers, paints and enamels), 77 N. 12th St., Brooklyn, N. Y., has made arrangements with Loos & Dilworth, Inc., Philadelphia, a very large and old established concern, to act as its distributors throughout Pennsylvania and vicinity. In order to insure the success of this venture, Mr. H. B. Wright, formerly connected with the Hildreth Varnish Co., Inc., has again returned to the fold, and will act as District Sales Manager in building up sales of Hildreth's products through Loos & Dilworth, Inc. Mr. Wright's long experience in Pennsylvania adequately fits him for this position.

Cutting "Finish Costs!"

Perhaps an inexpensive variation in your finishing conditions will permit you to use a high-grade quality product that covers well in one or two coats, baking in minimum of time, increasing oven output, more production at reduced cost without sacrifice of your finish.

Our experimental finishing department is complete; 5′x7′9″ electrical heated oven, with spray equipment, 5′ booth, under direction of trained operators, and laboratory technicians will determine the Impervious product best suited for your requirements.

A recommended "Impervious" formula will be a demonstrated and proven product for which it is prepared.

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"As you know, the effective and efficient finishing of hard maple tops for laboratory desks and chemistry equipment, so that the surfaces will have an acid-resistant surface, requires considerable experimenting.

"This article is based upon the standard practice developed for a manufacturer of such products, and the results from its use have been such as to warrant its publication."—

C. F. Scribner

AN ACID-RESISTANT FINISH ON LABORATORY FURNITURE

Revealing the formulas, materials and the methods employed in preparing and applying a satisfactory acid-resistant finish on glued-up maple tops for laboratory furniture

By C. F. Scribner, M.E.

THE TOPS OF LABORATORY desks, chemistry equipment, biology tables, etc., are required to be made from selected hard maple. These tops are glued up in strips about 2-in. wide, using a high grade of animal joint glue, in some cases being bolted together in addition to glue jointing.

The top surface must be free from defects and it has been found that nothing is superior to the double V-joint in making the glue joint.

After the final finish-planing and sanding it is necessary to finish these tops, including the edges, with a finish which will be acid-resistant, so that in use they will remain in good condition for a long time, despite the hard usage which they are sure to receive.

For a leading manufacturer of these products, the following details of this acid-resistant finish were worked out and have been in successful use for several years.

Stage A

In one gallon of distilled water dissolve:

Potassium Permanganate ..... ¾-lb.
Cupric Sulphate ..... ¾-lb.
Ferro Sulphate ..... ¾-lb.

Heat this solution to 160-deg. F. and apply hot, 2 coats.

Stage B

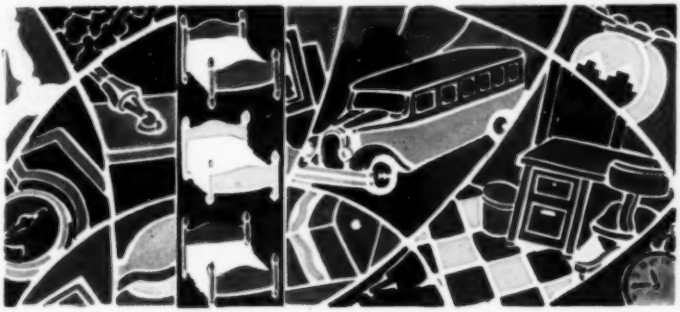
In one gallon of distilled water dissolve ¾-lb. aniline hydrochloride, heat to boiling point and apply three coats hot. After the last coat has thoroughly dried, sand lightly.

Stage C

Apply five coats of raw linseed oil, allowing the work to thoroughly dry after each coat. Finish by polishing with a slightly oiled cloth.

Readers of INDUSTRIAL FINISHING who have any of this kind of work to do will find that the results from this finish, both as regards appearance and wearing qualities, will be all that can be desired.

Leading industries do not sell price; they appeal to people's wants.



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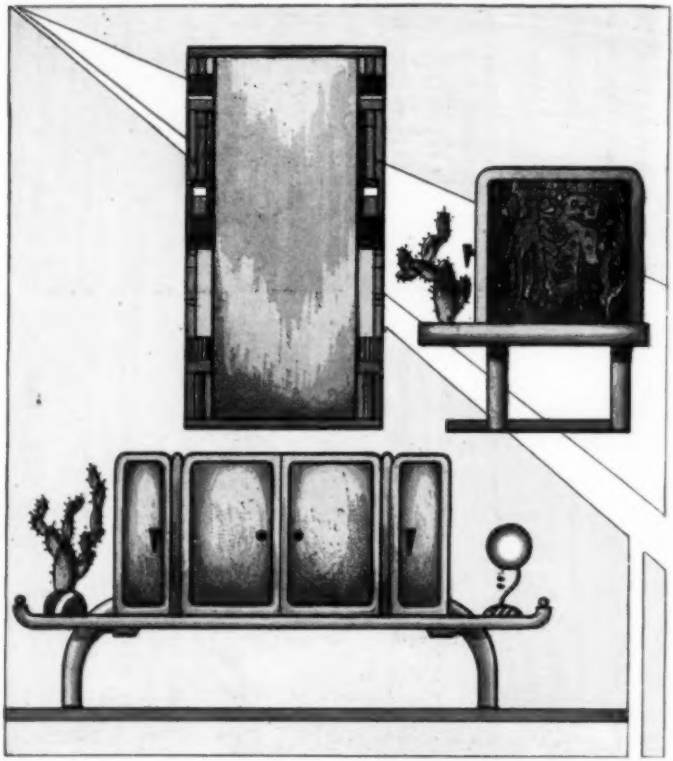

Front and Side Elevation of Modernistic Chest

This chest is made of curly maple or nutwood and has an interesting series of doors. The cabinet in the center can be used for hats and the side cabinets for rubbers, etc., if it is used as a hall stand. If it is built as a bedroom chest it can be lacquered and the shelves used for lingerie. The inner shelves used should be a contrasting color in either case.

It is to be noted that the posts or legs form a continuous pattern through to the chest proper and through the outer shelf. This outer shelf can be utilized for a lamp or plants or boudoir necessities. The cabinet proper is not built in three sections, as one might be inclined to believe; the grooves or indentations at the top and down the face are all machine work.

The knobs and buttons should be of a soft contrasting color and should remain in relative proportion as illustrated.

Referring to the side (or end) view at the right, you will observe the use of snake skin decoration. This snake skin panel lends an individual note, but in place of it one can substitute a black silhouette outlined in white, or copper and brass designs inlaid. Copper and brass are the chief features of ornamentation for the 1930 season. Black with silver or white are also very good.

The mirror has side bands made of various woods set together to suggest inlay within a copper or brass

NEWEST FURNITURE STYLES FROM EUROPE

Industrial Finishing's Specialist in colorful modern art and design, traveling in Europe, submits interesting notes, ideas, suggestions and color illustrations of the latest styles in European modern furniture

By La Vera Ann Pohl

MANY FURNITURE manufacturers have been afraid of Modernism; they may have shown a timid interest in it but they still cling to their period styles, with a keen eye on the clock, wondering when the pendulum will swing the other way.

Today one needs but to walk down Fifth Avenue in New York City, or through the furniture galleries in Germany or France and see the modes of the day, to be convinced that the styles of the bygone days have vanished. Modern furniture quite naturally has adjusted itself to the present mode of living. It is an expression of this era. Architects are making an effort with new home building, but as yet we have not enough new homes in the modern style to take care of the ever-increasing quantity of this new furniture.

The transition from the old to the new takes time and energy. It is an evolution, and evolution requires time for growth. However, thus far we have been accepting modernism gradually in our homes and adjusting our surroundings to it. More and more the designer and manufacturer have been making their influence felt in smaller articles such as chests, cabinets, chairs, lamps, baskets, pictures, breakfast-room furniture and odd pieces of bric-a-brac of all styles and descriptions. These pieces have all been growing in volume of production and it will not be long before the American homes will have all "gone Modern."

To the manufacturer will fall the lot of satisfying the demand of an ever eager public. It is the manufacturer's particular task to

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(From Opposite Page)

tray. The top and bottom strips are copper or brass highly polished. When the work of setting together (assembly) has been accomplished, the bands on the long sides are given several coats of high-gloss varnish and rubbed until the inlay appears as porcelain enamel. One noticeable feature characteristic of both the mirror and the chest is the excellent workmanship.

Workmanship representing perfection is required in Modernism—excellent cabinet work as well as high-grade finish. In all the history of furniture construction there has never been such possibilities for variations in woods used. From all quarters of the earth tradesmen have brought, and made it possible to bring, new woods which hitherto were inaccessible for furniture manufacturers. Many woods never before heard of, are developing the most unique and interesting articles in modern furniture.

If the finish and the cabinet work present a high standard of excellence, the article will have every opportunity of sale—provided of course the design is fundamentally good. The workmanship must be flawless: No visible joints or seams; all holes must be filled, smoothed over and polished. The Modernist is a perfecter of details in every sense of the word.

know when furniture is good or bad. When the manufacturer is not sure, the advice of capable designers should be sought—designers who know what modern furniture really is. Even now it is obvious that there are many designers who have never studied Modernism—who are creating curves and angles which bear no possible relation to the real designs called "Moderne." From these designers people learn of what is bad in Modernism.

It is true when Modernism first came to America—and that was not so long ago—many manufacturers had their designers design new things to meet this new mode. Most of these designers had no real knowledge with which to work and as a result many really bad things were presented to the public. In Modernism, a basic knowledge is required and is as necessary today as it was in the time of the Chippendale period to design Chippendale furniture.

That this new idea is built upon sound logical reasoning never seems to have been given a thought. That perhaps certain new theories and new forms were built with sound reasoning seems to have been entirely overlooked. This very fact has been the real cause and reason why many a manufacturer's product went stale on the market.

There are, however, many manufacturers of furniture and novelty furniture who have been successful in presenting this new style to the public. They have been repaid. Modern furniture is a reflection of this machine era, the era of mechanical things. It is practical; it is comfortable, it makes for peace and cheerfulness; it is simplicity itself.

The modernist considers color as much a part of his design as he does the construction itself. It is a systematic arrangement of line, form and mass. It is orderly and it is not extravagant in decoration—elaborate ideas are not a part of modernism. It makes for ease, comfort and beauty.

The accompanying plates show a chest and a mirror in the "Style Moderne." The most striking thing about them is their complete simplicity of line—their definite ability to harmonize with furniture of another period—which is one important feature for volume sales.

Every automobile show, home furnishing exhibition, and co-operative display of merchandise today, is a great tribute to the power of color, and dealers know that a beautiful finish is the first feature and advantage that a product should have.

Nichol's New Bulletin on Sadwith Industrial Oven

Nichols Products Corp., 12953 Greeley Ave., Detroit, Mich., is now distributing its new bulletin of eight 8½ x 11-in. pages which illustrate and describe construction features and exhibit installation views of the new Sadwith Industrial Oven Panel, a standardized sectional oven for use in drying and bake-finishing operations.

Roxalin Opens Chicago Branch

The Roxalin Flexible Lacquer Co., Inc., recently opened a branch office at 230 E. Ohio St., Chicago, Ill. Mr. Milford H. Corbin, Ch. E., who has been associated with the technical staff, is in charge.

This branch will render a full technical service to middle western accounts and, in addition, will be in a position to offer excellent deliveries on Roxalin standard items which will be conveniently warehoused in Chicago.

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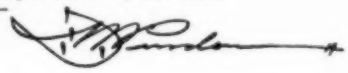

MODERN LACQUERS

Calling attention to differences in lacquer formulas, revealing results of several tests, explaining why some failures have occurred and emphasizing the importance of using a lacquer that exactly meets one's conditions and requirements

By F. M. Purdon

BEFORE LACQUER began to be featured as a finish on automobiles, most people thought of it as being a material used chiefly as a protective coating for silver, brass, copper, etc.—being thin in body or building qualities, transparent and having rapid-drying characteristics. But now a new interpretation is associated with this word "lacquer." To-day, in production factories, "lacquer" brings to mind a finishing material made with a nitrocellulose body or base, producing increased body or building qualities in comparison to the former type of lacquer which was used to protect polished metal.

This modern heavy-body nitrocellulose lacquer, which has become so popular and so widely adopted, was supposed to possess many advantages over varnish and other finishing materials used in wood and metal finishing.

At first, much stress was placed upon the fact that this new heavy-body finishing lacquer was strictly pure cotton or nitrocellulose base. It did not require very long to definitely prove that a strictly nitrocellulose-base lacquer was, in many ways, unsatisfactory as a finishing material for wood or metal. Accordingly, changes were made in the formulation of the material.

Differences in Lacquers

Today, the term "lacquer" no longer implies a strictly nitrocellulose material; we now find that various gums form a large proportion of the modern production lacquer. This change was necessitated in order to produce several necessary qualifications which the first heavy-body lacquers lacked; chiefly these were body or "build," adhesion, brilliancy, etc. So we see how loosely the term "lacquer" is being used.

There is no standardized lacquer formula; in other words, the exacting qualities one may expect from lacquer are not to be found in every formulation, though each make of lacquer has its specific place in finishing. As previously stated, the formulation covers a broad scope. Lacquers range from an all-nitrocellulose base (practically) to an almost all-gum base having a small amount of nitrocellulose as a binder.

There is a wide difference in various makes of lacquer. The user must be careful to select a lacquer formulated to meet his concern's specific requirements.

NEW

PRESTO FLOOR TYPE ELECTRIC SPRAYING UNIT MODEL 84

For Paints—Varnishes—Enamels—Lacquers

Quick changes can be made for colored materials—or from Fan Spray to Round Spray. And the outfit can be operated continuously, for hours at a time, without interruption. Price $39.50.

Finger tip control—light weight—higher pressure—more powerful motor—perfect atomization—double filtration of air—seamless 1 qt. aluminum container—clamp-on can cover—these are a few of the advantages that make the new Presto 84 a better, faster, easier to handle electric spraying unit.

With it, the rawest amateur can apply a smooth, even coat of paint, lacquer, varnish, bronze, enamel—quickly and cheaply.

The new Presto is exceedingly *economical in the application of paints,* because there is less evaporation of the solvents, and a correct distribution of air and painting materials. And there is no distortion of the materials to cause an uneven finish.

Two air filters remove every particle of moisture, oil and dust—assuring clean, dry air, always.

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City.....*State*.....

1 P-10

If one is misled to believe that all lacquers are made practically the same, or that they have practically the same qualities, and allows price to govern the purchase and type of lacquer to use, he may be sadly disappointed with the final results on the finished product.

The outstanding and very noticeable feature today is the fact that there are so many people who are able to tell the world that lacquer is made of "cotton being nitrated," etc. The fact is that the cotton content of a well-balanced wood-finishing lacquer represents only a small proportion, as compared with the gum content. This factor has made lacquer possible for wood finishing and as a result it has revolutionized the industry. Some of the first experiments with lacquer that had a straight cotton base, and which was short of gums, produced very costly results. Nevertheless these things must happen to the pioneers in all new and unexplored fields.

Price of Progress

The expense incurred in overcoming these unsatisfactory features of the first heavy-body wood lacquers represents part of the price we pay for progress. Research work costs plenty, but the lacquer manufacturers have largely footed the bill. Of course, they have had the co-operation of many concerns that use finishing materials. A comparison of any make of lacquer of seven years ago with the same brand today shows the splendid results that research work has accomplished. But this experimental and research work has not stopped.

At present we recognize the need for new or cheaper solvents, or some improved method of producing the solvents which we now have, as this is the chief item of expense in the manufacture of lacquer today.

I believe I am safe in saying that lacquer has been much more successful on metal products, such as the automobile, than it has been on wood. There is a very clear reason for this fact. First, metal is less affected by atmospheric changes. Second, metal is not so porous. Expansion and contraction of the surface due to changes in moisture content (on account of atmospheric changes) does not have to be considered when finishing metal, although extremes of temperature do cause some expansion and contraction of the metal.

Flexibility Required

Lacquer for wood finishing must retain a certain amount of flexibility, or trouble is sure to develop when the finished product gets to be eight months or a year old. Butt veneers or inlays, joints, etc., are sure to show the effect of a lacquer that is not flexible. But the hard, smooth, even surface of metal leaves little to be desired as a foundation for a perfect finish, whereas the porous nature of our fine cabinet woods must be reckoned with first.

This condition alone has presented a few problems for the manufacturer of wood fillers. Fillers that were successfully used under varnish would not withstand the vicious attack of some lacquer solvents, therefore it became necessary to manufacture filler of a different type to overcome this condition.

The soft structure of wood as compared with metal, expansion and contraction across the grain

(Continued on page 45)

Spray? Dip? Brush?

Opex saves time and cuts labor costs

The remarkable, smooth working qualities of Opex are apparent immediately to the man who has used lacquer. The material contains a rich solvent mixture that provides a smooth flow and, as there is no "false body," Opex covers well even after a heavy reduction. Because of its easy working qualities and the fact that it dries quickly, Opex speeds up production schedules and permits the men to turn out more work in a given time. Constant laboratory control assures a dependable uniformity that eliminates finishing delays due to the variation in working qualities of lacquer.

Opex finished products stay good-looking because binder and pigments are scientifically balanced so that the finish will not break down or chalk even under abnormally severe conditions. A saving in material cost is effected because less Opex is required, due to its remarkable covering capacity. It is important, too, that nothing injurious to the health is used in the manufacture of Opex.

A Sherwin-Williams representative, thoroughly experienced in modern finishing methods, will gladly make a practical demonstration of Opex under your own plant conditions. These men have shown the way to reduced costs and finer finished products in thousands of finishing departments throughout the United States. Please use the coupon.

THE SHERWIN-WILLIAMS COMPANY

601 Canal Road, N. W. Cleveland, Ohio

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OPEX LACQUERS

Trade-Mark Registered

The Sherwin-Williams Co.
Dept. 708, 601 Canal Road, N. W., Cleveland, Ohio.

We are willing to have a Sherwin-Williams representative call and demonstrate Opex advantages. This does not obligate us.

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Tarnish Proof

A New ROXALIN LACQUER

RESEARCH BULLETIN 27

PROBLEM: To develop a tarnish-proof lacquer which will not change color when applied to Silver or Brass. ¶Which will prevent the formation of tarnish spots on the metal. ¶Which will have perfect adhesion. ¶Which will not cost more than ordinary lacquers.

COMPARATIVE EXPERIMENTS: *Thirty-Day Test:* (complete material to perform this experiment will be sent you on request, including test-tubes, strips of brass, corks, labels, etc.) Place a strip of brass in a test-tube containing our tarnish-proof lacquer, and another strip in a test-tube containing an ordinary lacquer. In the second test-tube, the lacquer will turn green with copper dissolved from the brass. Dark, irregular spots will form on the metal. *There is no effect on the tarnish-proof lacquer or the metal for at least thirty days.*

Silver Tarnish Test: Spray a piece of silver plate or sheet silver with the new lacquer and a piece with ordinary lacquer. Cover the metal with paper, and lay a section of sheet rubber (from a rubber glove or hot water bottle) on each piece. Place in an oven overnight at 110° F. Tarnish from the sulphur compound in the rubber will indicate at once which lacquer is the more tarnish proof.

Adhesion and Flexibility: Flow the new lacquer and an ordinary lacquer side by side down a sheet of polished brass. Place the sheet in an oven overnight at about 110° F. The next morning bend the sheet sharply across both lacquer films to determine which flakes or chips more readily.

RESULTS: A new tarnish-proof Lacquer for Silver and Brass is available with no increase in cost, which has been time-tested by our own customers who have been using it commercially.

SERVICE OFFER: Samples of the new lacquer will be sent on request, including a complete testing kit for the *Thirty-Day Test.* Write to our Sales Department please.

* For the ETCHED NAME PLATE industry there is a Roxalin Tarnish-Proof Lacquer which will stand stamping and forming.

ROXALIN FLEXIBLE LACQUER COMPANY, Inc.

105-9 Seventh Ave., Long Island City, New York

Some Recent Research Bulletins which may be had on Request

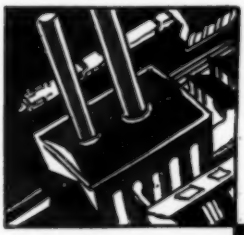
☐ No. 21—About Flexible Lacquers for Brass, Aluminum and Nickel Silver.

☐ No. 23—About the *one coat* color backgrounding of etched nameplates.

☐ No. 24—About wood cement for Lacquer finished furniture.

☐ No. 25—About a Non-Jellying Bronzing Lacquer.

☐ No. AB—About a Flexible Finish for Cork and Tile Flooring



INDIVIDUALIZED FINISHING SERVICE

HAVE YOU an unusual finishing problem which standardized finishing materials will not solve? ¶ MAYER & LOEWENSTEIN specialize in the production of **different** finishes for the special requirements of individual industries. ¶ **M&L** laboratories are equipped to adapt or create the finish **for the job . . .** the ideal way to insure perfect results on difficult work. ¶ This service is always at your command.

Clear Lacquers . . . Colored Lacquers . . . Building Lacquer Primers . . . Varnishes Varnish First-Coaters . . . Oil Enamels Baking Enamels for Wood or Metal.

MAYER & LOEWENSTEIN

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ESTABLISHED 1846

Modern Lacquers

(Continued from page 40)

of wood, and the irregularities of these conditions in the individual factories—these factors have furnished perhaps the greatest of all problems in producing a satisfactory lacquer finish on wood. Much could be written on this subject alone.

With the foregoing factors and conditions in mind, it does not require more than an average intellect to understand that it is difficult to produce a lacquer which may be used successfully in various factories—without some changes being made in other parts of the finishing process. There were many who did not realize this fact until after they had witnessed considerable loss from work that proved unsatisfactory.

Why Failures Occurred

Again, there were those who instead of changing their methods to meet the requirements of lacquer, gave up in disgust, called it a "newfangled" finish and stamped it "N.G." Others began their lacquer finishing experience with a lacquer that was unsuitable for the type of finish they expected to produce. Seven or eight years ago it was difficult for lacquer manufacturers to find men who were capable of demonstrating the proper methods or produce a lacquer finish with complete success. The required knowledge of lacquer and its possibilities was then limited. Many finishers had to learn from their own experience: some succeeded; others failed. The factories in which lacquer was first used successfully were the factories where the finisher in charge was capable of carrying out exacting experiments to determine what difficulties or devilment was to be overcome; then to find a solution for each and everyone. There were many problems to be solved by both the finisher and manufacturer of lacquer.

The Chemist's Problems

Some of the problems the lacquer chemist had to solve included bridging, lack of adhesion, lack of brilliancy, blushing, shrinkage of film, poor flowing, and insufficient building body. The problems confronting the finisher were: a better wood surface, filler difficulties, bleeding of stain, and last but not least, the proper application of lacquer coats. We laugh at these troubles today but they were not laughing matters then.

One can readily understand the amount of study necessary to progress to the point where it became possible to create a lacquer finish which is really successful on wood. Many experiments have been and still are carried out in laboratories on small panels which did not and do not work out so well when sent out to the user of lacquers. The reason for this is that the same conditions and problems were not met as when the lacquer was or is used in various factories. Almost every factory—becomes somewhat of an individual problem. Thin veneers, glue seepage, soft veneers, mouldings, corners, large surfaces, all these and many more go to make up special types of problems.

The manufacturer (lacquer user) who had the misfortune to meet reverses with the first attempt at a lacquer finish and who gave up, condemning lacquer, must come back eventually for another trial. He will receive this new trial under much more favorable conditions than was possible formerly.

Lacquers Not Standardized

Lacquers are not a standardized product. Various makes differ widely. I am not going to tell here what lacquer is made of, or what it is supposed to be made of. This you have read many times. It doesn't mean a thing to you. What we all are concerned about is the positive results we are able to obtain with this material on the finished product. The chief fact I want to emphasize is that probably no two lacquers are made exactly the same, although several may be used successfully for certain kinds of work.

Three lacquers that I examined recently showed the following wide variations in construction. First let me say these lacquers are of reliable manufacture. I examined them to determine the body or building content, which is represented by the solid content of the lacquer. I used two liquid ounces for a working sample.

No. 1 contained 3 grams of solids.
No. 2 contained 9 grams of solids.
No. 3 contained 9 grams of solids.

It may be seen that one coat of No. 3 is equal to three coats of No. 1. Each of these lacquers has its place in wood finishing however.

Lacquer No. 1 had a very fine cotton base and is being used by a large furniture factory I visited in New York City. This concern uses five coats of the lacquer which is very thin in body. After the rubbing operation the final finish shows the pore effect of the wood, and it is a hard fine-wearing type of lacquer for the particular type of finish involved.

No. 3 is the type of lacquer used for the so-called "piano finish." No. 3 was also the most flexible lacquer of the three samples. This was due to its high gum content.

Acceleration tests of these three samples showed the following results: No. 1 stood 21 treatments; No. 2 stood 33 treatments, and No. 3 stood 41 treatments before the film broke down. To the eye alone, these three lacquers seem to have the same body, and in all other appearances they seemed very much alike, but the tests as made proved without a doubt a wide difference in their performance.

Those who have not been successful in finishing with lacquer must remember that all lacquers are not alike; in fact probably no two are exactly alike in every respect. The term "lacquer" should only mean to them a quick-drying finishing material, nothing else. With this thought in mind they should try again, but they must select a lacquer to meet the requirements of the finish they expect to produce. There is no reason today why one should not finish with lacquer and receive the benefits of increased production—if the product will stand the slight increase in cost. There is an increase in cost when using lacquer for the built-up type finish, but this may not be as great as is first imagined.

There are great possibilities in the flat lacquer; this eliminates the hand-rubbing cost and in regard to wearing qualities, properly formulated flat lacquers are just as good as clear lacquers. There has been rapid advancement in the manufacture of lacquer—also in the methods of its application, etc.—since the first heavy-body lacquer made its appearance.

Bring the American home back into fashion and, in so doing, increase the gross business and net profits of furniture manufacturers

Spray . . Dip
Brush . . . Tumble
Which is Best
for Your Lacquer Jobs?

LET our finishing experts help you decide. These practical men have serviced thousands of manufacturers. With a little study they can tell you not only the best methods, but the best class of materials for your individual requirements. This important service is available without cost or obligation on your part. It is free to Day customers and to manufacturers who are interested in Day materials. But it may prove invaluable to you through reduction of your material or labor costs. Give us a few particulars to begin with. Perhaps we can submit recommendations that will repay your trouble a thousand fold.

JAMES B. DAY & CO.

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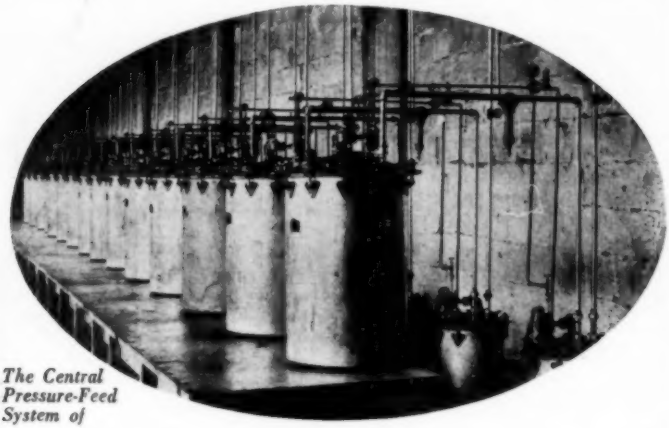

The Central Pressure-Feed System of

FORCING MATERIAL TO GUNS CONTINUOUSLY

Executive Vice-President of Binks Mfg. Co. describes and illustrates modern methods of supplying finishing materials to spray guns in automobile factories where the demands are for volume production and quality workmanship in several different colors.

By J. F. Roche

SUPER-PRODUCTION methods are largely responsible for the favored position that American manufacturers and their products now hold in international markets. Their standardization has given the greatest quality for the world's dollar.

Many manufacturers have seen products of inferior quality but beautifully finished and polished, greatly outsell superior products which lacked the appeal of the finishing touch.

Today, greater consideration than ever before is being directed toward every phase of finishing. Finishing experts are being consulted regarding the application of suitable finishing materials. Every large paint manufacturer has, somewhere in the factory, a research laboratory which is kept busy meeting the varying finishing requirements of manufactured products.

With millions of automobiles being finished annually, it is evident that if the spray method of application had not kept in step with progress, a very different state of affairs might now be in existence.

Spray finishing is a well devel-

At top of page: A typical material-feed booster system installation in the Hupp Motor Car Corp. plant, Cleveland, Ohio.

Have You Tried Marietta's New Sandseal?

Now heavier in body—a greater value for the money

It Sands With remarkable freedom and ease within a very short time after application.

It Seals over stain or bare filler or bare wood. It is an excellent body builder under either Varnish or Lacquer Coatings.

QUALITY—SPEED—ECONOMY

MARIETTA PAINT & COLOR COMPANY

MARIETTA, O. **HIGH POINT, N. C.**

MARIETTA WOOD AND METAL FINISH SPECIALISTS

"THE ENDURING FINISH"

VALENTINE'S

VALSPAR FINISHES

WATERPROOF — WEARPROOF

Of importance to all furniture manufacturers

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"VALSPAR" *Clear Wood Lacquer*
"VALSPAR" *Flat Wood Lacquer*
"VALSPAR" *Lacquer Sealer for Wood*

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These are "VALSPAR" Quality Products, extremely durable, with maximum body and fullness; made to meet the most exacting production schedules; non-blushing; easy rubbing.

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"VALSPAR" LACQUER FINISH on your Furniture, Radio Cabinets, or other Products, provides your Sales Staff with an unbeatable sales argument — backed up by our National "VALSPAR" Advertising.

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For further information, samples and prices, address:

INDUSTRIAL DIVISION
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386 Fourth Avenue
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oped art of applying the finishing touch. While the spray gun is of great importance in the finishing room, the method of properly handling material is quite essential also. For some time the overhead gravity-feed bucket was considered an ideal arrangement, but this system does not afford the necessary speed that the larger plants require, and in addition several states have condemned this method of handling inflammable materials. Another method adopted by production plants consists of individual small-capacity pressure containers for each spray operator. However, due to the present demands for several different colors, a large number of pressure containers are required for each spray operator. The refilling of these small pressure containers requires time and necessitates the transfer of materials from paint storage to the spray room.

Central Pressure Feed

The central pressure-feed system was designed to meet modern production requirements in automobile factories and other establishments having similar problems. By this method it is possible to locate one large 60 or 100 gallon tank for each color in a central paint room and pipe the material direct to spray guns at the spray booths throughout the plant.

When the large pressure tanks run out of material, it is not necessary to stop spraying until they are refilled. This would be very serious in plants that did not have the line method of spraying and doubly serious in the plants using lines, because it would be necessary to shut down the whole line and tie up the entire production of the finishing department until the material containers were refilled with paint.

This problem has been completely solved by the invention of the *material feed booster system*, which is shown in the accompanying illustration of an installation in the Hupp Motor Car Corp. plant at Cleveland, Ohio.

The larger tanks—the 60 gallon pressure material containers—are filled with material, and air pressure is applied to force the material into the smaller tank. This is followed by applying air pressure into the smaller tanks, sending the material through the line to the spray gun.

When the supply of material in the larger tanks is exhausted, the air and material supply is shut off by closing the valve in the lines leading to the smaller containers. This allows the continuation of operation while the larger tanks are being replenished. When they are filled, the valves are opened and the regular flow of material is resumed.

Cleaning the Supply Lines

Another decided merit of this system is noted when it becomes necessary to clean out the paint lines. The material is forced from the smaller tanks to the larger tanks and the valves are closed, keeping the mixture in the larger tanks. Then the small tanks are filled with a liberal quantity of the solvent used, and this is forced through the paint lines as a cleansing agent.

In factories where it is necessary to pipe the material for a great distance, I might add that the finished coat can be piped practically any distance required. In a large automobile body plant in Evansville, Ind., the surfacer

and prime coats pass through the pipe line 500-ft. from the paint room to the farthest spray booth, yet this company encounters no difficulty whatever, but gets a constant flow of properly-mixed materials at every spray gun.

These automobile companies report that this system not only increases their output and decreases their cost of operation, but also gives that beautiful finish which the buyers of automobiles now demand.

SANDING WITH FINISHING

Sanding to smooth and clean wood surfaces before finishing begins; sanding between applications of finishing materials; dry and wet sanding; open hand and handblock sanding; short and long strokes; light and heavy sanding, etc.

By C. Dan Youngs

ANY WOOD FINISHER who desires to become an expert in his profession must give considerable attention to the subject of sanding, or his finished product will frequently show that something is lacking. There is no doubt but what the proper sanding of a wood surface in the white and between certain finishing operations is one of the most essential factors entering into the finishing process. It is absolutely necessary that the finisher have a smooth surface to work on; otherwise his work is doubled and the final result is questionable.

The proper sanding of various kinds of woods and wood surfaces cannot be learned in a day, nor is it possible to place inexperienced men on such work and secure good results. However, in many shops, it is the custom to place unskilled men in the sanding department, the management believing that there they can do the least damage or perform the greatest amount of work to earn their wages. Yet it is obvious that here is one of the most important departments in the factory, for here the ultimate finish is either made or marred.

In this article I will not go into the subject of machine sanding but will confine my remarks to hand sanding—the sanding of the finished article, or portions thereof, before it is turned over to the finishing department.

Naturally it is important that the proper grade of abrasive be selected for the article to be finished. A very coarse paper, of course, would not be suitable for preparing a surface for the finest finishing, but there are many grades from which to choose. The cutting power must be taken into consideration, as must the smoothness, and it is also important to consider the durability of the sheet. One which quickly fills up with dust is more expensive than one which can be used repeatedly.

The item of first cost should not be neglected, for in abrasives, the initial cost is a small part of the total cost. The labor cost, and the cost or replacement (where a sheet can only be used for a short time) are also important factors.

This selection of proper sand-

In justice to you and to ourselves

We urge you to read and act upon this advertisement

Here are merely the bare facts

1 The basic ingredient of Murphy Flexible Lacquers is not nitrocellulose but is radically different from ordinary lacquer.

2 They have a greater depth of film and build far better than ordinary lacquer.

3 We have never seen, even with varnish, a polish of higher brightness. And, unlike lacquer, the finish increases in clarity as it ages instead of fogging.

4 Instead of chalking and checking as ordinary lacquers do, Murphy Flexible Lacquers actually toughen with age.

5 Murphy Flexible Lacquers, as their name implies, are like varnish in having the plastic resistance to the expansion and contraction of wood—a notable failure of the rigid finish of nitrocellulose lacquer. They are unaffected by humidity checking, so much deplored in lacquer.

6 They give the appearance and "feel" of varnish instead of the cold, glass-like surface of lacquer.

7 Murphy Flexible Lacquers are entirely waterproof.

8 Murphy Flexible Lacquers dry as quickly as lacquer, but look and act like varnish.

9 They are more durable than either varnish or nitrocellulose lacquers.

10 They are designed for both interior and severe exterior service.

We have sold thousands of gallons of Murphy Flexible Lacquers to hundreds of concerns who formerly used either nitrocellulose lacquer or varnish or both.

The verdict is that these Flexible Lacquers are a remarkable material—a material that combines the best features of lacquer with the best features of varnish and is more brilliant and more durable than either.

Anyone concerned with finishing who does not know the true performance of these Flexible Lacquers is letting something get by him.

In justice to yourself, get the facts, get a demonstration, get a quart, get going.

MURPHY VARNISH COMPANY

Newark San Francisco Chicago

Essex Varnish Company, Newark

(Associate Company.) *Baking Material Specialists*

paper is one which should be carefully watched, and rightly so, but it frequently happens that more care is given the selection of the right abrasive than upon the choice of a workman who is to use it. Many jobs are spoiled because the handsander is not skilled in his craft, and thus the finish is spoiled or made more than doubly difficult by scratches, deep marks and gouges.

Hand sanding strokes should be with the grain of the wood; really this is the A B C of the work, but too many operators fail to realize the danger of the short stroke and, as a consequence, their work shows circular marks at the ends. A dozen light strokes are more effective than three or four heavy strokes.

Wetordry Abrasives

During the past ten years a radical change has occured in the use of abrasives, due in part to the progressiveness of the abrasive manufacturers and in part to the prevalent use of lacquers in finishing. Development of "wetordry" abrasives has filled a long felt want, and in the automotive manufacturing and finishing industries they have placed dry sanding in the discard. No automobile manufacturer of today uses dry sandpaper for all operations. This is due to several reasons: a wet paper is more flexible; it does not gum up so badly; there is less danger of scratching; and it is more healthful for the operator because his lungs do not become filled with the dust from dry sanding.

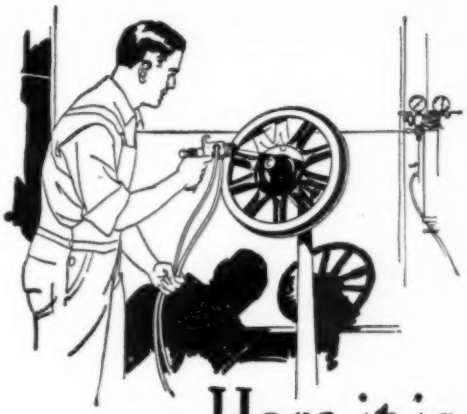
This class of abrasive of course, has been more popular on metal work than on wood because of the danger of raising the grain of the wood in certain instances, but "wetordry" sandpaper is used to a considerable extent in wood finishing also. In wood finishing, after the initial coats of shellac, lacquer, varnish, etc. are applied, there is no danger of the grain raising, for the pores are sealed. But even then, expert sanding is required; it is so easy to sand through the initial coat if an operator is careless or inexperienced.

Where a finish is to be applied, it is better to use "wetordry" paper with water rather than with oil, because of the liability of some of the oil remaining on the material, with its attendant danger to the finishing coat. Water will evaporate whereas oil will not; an oil must be thoroughly removed before succeeding coats of finish are applied. There is probably nothing to be gained by the use of oil instead of water, unless it be taken into consideration that oil will rub smoother and make the abrasive require less moistening during the operation.

In many plants the workmen are using wood sanding blocks, but it is my opinion that this causes more trouble than the hand, especially on finished work, due to the lack of flexibility. Where heavy sanding is required, the block will help to make a more even surface and it is less tiring to the operator; but on finishing coats and on work where corners and edges are to be sanded, blocks should not be used, unless they are made of hard rubber or some other resilient material.

Between Lacquer Coats

Since the advent of lacquers in industry, sanding methods and practices have of necessity undergone changes. In some plants it is not customary to sand lacquer between coats but in my opinion a



Here it is . . . a tough finishing lacquer that *Stands Up!*

Berryloid 507 Clear is a non-porous, waterproof finishing lacquer that stands up on wood, fabric or metal. Beating sun, extreme cold or rapid temperature changes will not harm it. This lacquer won't chalk, blister or peel—dries to a tough, elastic finish that wears and wears. It can be applied over lacquers or enamels and is recommended for outside or inside use. Berryloid 507 Clear beautifies and protects automobiles, airplanes, signs, doors, window frames and all exposed surfaces where a lacquer finish is desired. It brings out a high luster that lasts. To have this protection for your products—write for complete information.

Fine Industrial Finishes

BERRY BROTHERS
Varnishes Enamels Lacquers
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light sanding with No. 3/0 or 4/0 sandpaper between coats gives a better looking finish and gives greater depth to the finishing coat. Varnish, of course, has always been sanded or rubbed between coats but, possibly for reasons of economy, a great many firms have eliminated this work where lacquer is used.

One of the largest manufacturers of pyroxylin finishes in the country recently ran an advertisement in which the concern stated that the sanding of lacquers, excepting on the initial cost, was merely wasted effort. Still, if a perfect finish is desired, whether on an oleoresinous or a pyroxylin product, a light sanding between coats will help to give a much better job.

Proper sanding requires infinite care and attention to detail. A single rub across the grain, or a heavy bearing down on an edge or corner is apt to spoil the ultimate finish. Even the hand of the sander, placed at random on the surface, is apt to press sanding dust into the finish and thus render almost impossible the proper finishing of the article.

It is almost a universal custom to place an apprentice or a beginner at sanding. This is an important part of the finisher's training, for no man can hope to become a successful finisher unless he knows and understands how to first prepare his surface, and especially how to handle it between coats. But the beginner should be instructed properly and impressed with the importance of his work, and taught to realize that his operations are an integral part of the properly finished product.

Lacquering Over Other Finishes

First, test the old finish to learn something of its characteristics; then clean it and apply sealer coats; spray on a comparatively dry lacquer coat first, and then follow with one or more wet lacquer coats

By M. V. Leach

NITROCELLULOSE lacquers, when applied over other finishes, present different conditions. If possible, determine just what kind of material was used on the article to be refinished, before starting to lacquer it. Was it a quick-drying short-oil finish or a slow-drying, long-oil finish? How long was it baked or dried, and what time of year was the finish applied? The more you know about this without guessing, the surer you are of success. If these things are known or can be determined beforehand, the finisher can proceed with a considerable advantage.

Test the Old Finish

If information is lacking, make a test as follows:

Warm a portion of the finished surface to about 80-deg. F. Notice if it feels tacky. If not, it is a good specimen to be lacquered.

LACQUER IT WITH ZELLAC

If there's merit in your product—

Sell it with Lacquer

We do not say that an inherently poor product can be given real merit with an excellent finishing material (though even that has happened). We do insist that the intrinsic merit of your product is likely to remain a hidden quality until you open the eyes of your public with an attractive lacquer finish.

Get attention with a beautiful and colorful Zeller-made lacquer finish, and half your sales job is accomplished. The final test of your product is the service it renders—but the first test of marketability is appearance.

Let Zeller help you sell your product by means of a Zellac finish. Zeller chemists will deliver you either a standardized or a specially-formulated grade of Zellac to meet your exact requirements. On a basis of highest quality at fair prices, Zellac lacquers and lacquer enamels will give you a new conception of salability and economy of your products.

ZELLER LACQUER MFG. CO., INC.
20 East 49th Street New York City

ZELLAC

FOR EVERY INDUSTRIAL PURPOSE

CHICAGO DENVER
LOS ANGELES SAN FRANCISCO
PORTLAND SEATTLE
WICHITA DALLAS

SAN-ITAI-RIE FILLER

Pat. No. 1658605

For All Defects in Wood

Manufacturers in all wood-using industries find SAN-ITAI-RIE FILLER unsurpassed in filling cracks, worm holes, knot holes, open joints, dents, pitch pockets, etc., and through its use are able to send out their products without a flaw.

Put up in friction top cans—half pints to gallons—in 20 different colors. Send for sample can.

SAN-ITAI-RIE FILLER CO.

Division of

164-170 W. Kinzie St. G. J. Liebich Co. Chicago, Ill.

Next, let the test piece cool to room temperature, wipe it with naphtha spray on a coat of thinner and note results. Did this treatment affect the finish? Did the thinner evaporate promptly, or did it become retarded by a partial dissolving action on the finish —with oils or gum of same acting as the retarder? If not, then smile broadly for you can be fairly well assured that no trouble will occur, or very little trouble at most.

But suppose the old finish was a long-oil paint, varnish or enamel, and that it was applied on days when the humidity was high, or as one old painter of my acquaintance says, "the dog(on) days"; and suppose further, that when dried as per instructions from the paint manufacturer, that original finish stubbornly remained tacky. The heat test will reveal this, the same as the heat of the body will soften varnish on a chair seat or back.

In this event, my advice is to wipe the surface lightly with a naphtha cloth; this will remove any scum or surface oil and help to harden the film of finishing material when the naphtha evaporates.

Shellac Followed by Lacquer

Next spray on two light coats of shellac cut in alcohol. Let the first coat dry before applying the second coat. Two light coats of a good grade of shellac are better than one heavy coat, because they dry to a harder film. This shellac coating will not affect the finishing material applied over it.

Then proceed to apply the lacquer over this "sealer coat," using a little care in doing so. The first lacquer coat should be applied by holding the gun farther away than in regular spraying practice, so that the lacquer will be applied rather "dry," yet wet enough to take hold of the shellac, although not biting through to the finish underneath.

The second coat of lacquer can be sprayed more boldly and with more confidence; it can be sprayed wet since the first coat, having been sprayed slightly "dry," is now in what is called a "thirsty" condition. This means that it will absorb some of the thinners of the wet second coat. Generally, the thinners start to evaporate before they have time to go through the first coat of lacquer and on through the two coats of shellac to the old original finishing material underneath.

Every lacquer user should know about **REZYLS**

Rezyl 12 is an important new lacquer ingredient, producing a new type of lacquer.

Rezyl 12 is a clear, synthetic resin never before produced for commercial use. Ordinary gums and resins impair lacquer durability, whereas Rezyl 12 greatly improves the lasting qualities, because it is not affected by ultra-violet light and imparts this quality to the finished lacquer.

Lacquers containing Rezyl 12 not only lengthen the life of the film, but prevent chalking and cracking.

Rezyl 12 can be used to make clear finishes, or can be used in pigmented lacquers. Properly formulated in clear lacquers, it outlasts any Spar Varnish and protects pigmented undercoats from destruction by sunlight. It is eminently suitable for automobile body finishing and for general use on wood or metal.

Rezyl 12 is now being introduced to lacquer makers. Its benefits are so remarkable that every conceivable test has been applied to verify results. They have been verified and lacquers made with Rezyl 12 by leading firms have been recently announced as ready for distribution. Every lacquer user should investigate at once the merits of this improved type of lacquer. For further information consult your lacquer supplier or write to:

Makers also of:
Rezyl Balsam 33, a plasticizer
Teglac 15, for furniture use
Ethyl Lactate, a high-boiling solvent

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AMERICAN CYANAMID COMPANY
535 Fifth Avenue, New York

American Cyanamid Company
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Send me information on Rezyls. My lacquer man is.....

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I use lacquers as follows:

( ) Furniture	( ) Clear
( ) Automotive	( ) Pigmented
( ) Industrial	( ) Wood
( ) Fabric Coating	( ) Metal

Name .....
Address .....
Mark for attention.....

Use Brushing Lacquer

Today, there are on the market several brushing lacquers that have less tendency to act as varnish remover. A first coat of one of these brushing lacquers sprayed on, followed by a regular finishing lacquer—this usually makes a satisfactory job. Of course, all of this is work for a spray man who has a practical working knowledge of modern lacquers, and in particular the lacquer he is working with. A little experimenting and testing beforehand will save much trouble and time later.

Really this is a problem that often demands information from the lacquer manufacturers; they are generally prepared to furnish a scientific and safe system, laboratory tried and proven, and if I had much of such finishing I would rather risk any of the systems recommended by responsible lacquer manufacturers—and I believe most of them are O.K.

The system I have described, however, works well over most any surface requiring a transparent lacquer finish; but if colored lacquer is to be applied over varnish, enamel or paint, a good oil-base, blister-proof surfacer or ground coat should be applied and given plenty of time to dry. In sanding this surfacer or ground coat, care must be taken to avoid cutting through the surfacer and exposing the enamel to the lacquer. However, if this does occur, these cut-through places can be touched up or spotted with shellac. A small touch-up gun is handy for this work.

M. P. Gould briefly reviewed the history of a dozen successful companies in different lines of business. Then he gave the motto of one successful manager, and said it was the motto of all. It is just this: *Do everything so well that they will want you to do it again.*

Whole industries are competing with each other—lumber vs. brick or lumber substitutes, steel vs. concrete, brick vs. hollow tile, linoleum vs. rugs, wall paper vs. paint, composition shingles vs. wood, oak vs. pine, mahogany vs. gum, beech vs. cypress, rayon vs. cotton, etc.

The art of decorating is not just making things pretty.

A Paint, A Varnish, A Lacquer
The three combined in
COOPER'S COMBINED LACQUER
Made in seven primary colors which can be mixed for any shade
Used either for
BRUSH, DIP or SPRAY
[*Lacquer Manufacturers For Seventy-two years*]
Chas. Cooper & Co.
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Established 1857

For Over 40 Years
BESECO - LACQUERS
Have Stood the Test of Time
Nitro-Cellulose Solutions of all Kinds.
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Harrison, N. J. Newark, N. J.

Our Adaptation of The Newcomb Syphon Ventilated Cabinet For Use on Outside of Buildings

Particularly desirable where finishing-rooms are located on top floor, when stack is eliminated and weather-top only is used.

This installation for the outside placing does not alter the Newcomb principle of construction, but does release about 80 sq. ft. of finishing-room space for each cabinet and eliminates all fire risk in the finishing-room from spray cabinets.

Let Us Tell You About This Installation

Grand Rapids Blow Pipe and Dust Arrester Company

Dust Collecting Systems **527 Monroe Ave.** **Grand Rapids, Michigan**

Have yu

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The maker who is proud of ... he ...
uses Egyptian Lac...

This is the Northern Life Tower, Seat... shi...

...e yu built *your* Masterpiece?

...proud of ...he makes
...ptian Lac...

...wer, Seat...shington

SUPPOSE *you* had the order for the bronze work and lighting fixtures in this magnificent building.

Wouldn't you make it a masterpiece? Wouldn't you plan to go into this gleaming corridor with prospective customers and say: "There! *That's* the kind of work we do!"?

Wouldn't you therefore *finish* it as beautifully and enduringly as you possibly could?

The Schilling-Evertz Co., Bellingham, Wash., produced this bronze work. And they proudly finished it in the best possible material—Egyptian Lastina No. 10.

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Lacquers

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A SEALER and first-coater of practically universal application that is BETTER .... because it is made of PURE SHELLAC .... because it is priced to compete with sealers based on cheap Manila Copal .... because, wax-free, it has more building body .... and because, unlike other sealers, it can be reduced up to 50 percent.

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SHELLAC COMPANY INC
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162 FRONT STREET NEW YORK CITY

Finishing Toilet Seats

How wood toilet seats and lids are prepared for the finishing department and what operations are included in natural mahogany and oak finishes, and in white and colored lacquer jobs

By P. C. Bardin

IN THE MANUFACTURE of plumber's woodwork there are problems of construction, design and finish similar to those encountered in the manufacture of furniture. The Knott Mfg. Co., at Tell City, Ind., uses approximately 600,000-ft. B.M. of hardwoods per year in the manufacture of two-piece doweled toilet seats and lids. The plant consists of a complete manufacturing unit, having in addition to the woodworking and finishing rooms, hardware finishing, plating, and polishing departments.

The final work in the machine room includes inspecting and touching up with sandpaper. The table on which this work is performed is unique in that it consists of a wood-slat top mounted over the mouth or an exhaust pipe about 36-in. in diameter. Fine dust is removed by suction of the exhaust fan while the seats and lids are being inspected and touched up with sandpaper. While still on the inspection table, the seats are air cleaned before going to the finishing department.

The seats and lids manufactured in this plant are finished in natural mahogany, natural oak, or in white or colored lacquer. Seats and lids to be finished in mahogany are dipped in a mahogany water stain, racked and air dried, after which they are belt-sanded. The next operation is filling, followed by cleaning with tow and rags. After being cleaned, the seats and lids are hand sanded and dipped in shellac. When dry, the surfaces are sanded, cleaned, and dipped in varnish, followed by a drying period of four or five days at the end of which time the surfaces are rubbed with pumice and oil and polished.

The finish on oak seats is more simple, the stain and first-sanding operation being omitted. Seats and lids are filled and cleaned, sanded and varnish-dipped. After drying about three days, they are sanded and the final coat of varnish is applied in the dipping tanks. After this coat has dried about three days, the oak seats are rubbed with pumice and oil, and polished.

Seats and lids to be finished in white or colored lacquer are primed with pyroxylin pri-

mer in the spray booth, followed by sanding, after which the surfacer is sprayed. When the surfacer coat has dried, the seats and lids are sanded and cleaned; then six coats of either white or colored lacquer are sprayed on, allowing drying time between succeeding coats.

After the final coat of lacquer has dried, the surfaces are wet sanded with No. 6/0 sandpaper and benzine. This sanding is followed by a polishing operation on power buffing wheels. The buffing operation is necessary to produce a highly-polished surface that will conform with the vitreous enameled fixtures on which the parts are mounted, and to permit easy cleaning.

For Dependable Finish
Auto Lacquers
Wood Lacquers
Metal Lacquers
Of Superior Quality
Chas. Cooper & Co.
10 Mulberry St. New York, N.Y.
Works: Newark, N. J. Established 1857

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Gums cut, fused or treated to meet individual requirements.
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R. L. POLK & CO., Detroit, Mich.
Largest City Directory Publishers in the World
Mailing List Compilers—Business Statistics
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Where Finishes Have Increased Sales

A touch of color will make a seemingly insignificant article more salable—more appealing to the eye and to the pride of ownership; and the increased sales of the more attractive articles have more than made up for the added cost of special finishing. A toy airplane put on the market last year and selling for one dollar only moved off retail counters rapidly when the manufacturer went into a color finish.

The manufacturer of a popular fly swatter recently turned out 200,000 swatters with red, blue and yellow handles and they moved twice as fast over retail counters in the spring of 1929 as the same article, with a plain handle moved in the spring of 1928.

When it comes to giftwares—a tremendously varied market—those small articles that have the best finish appeal most strongly to retailer and consumer alike. The owner of a group of gift shops in greater New York declares that color is the most effective selling factor in the giftwares line.

"We must rely almost exclusively upon display in this busi-

down to BRASS TACKS for a change

WE'VE been having a good time with ALAKA ads. We've been making fun of lacquer troubles.....because our customers laugh at them too!

But it's time to be serious for a change. This is a busy season, and you need your lacquer *right*. This is no time for foolishness!

Maybe you don't know what the shooting's all about? .....Maybe you've never tried ALAKA? (Write for samples, now!) Here's the dope:

[1]

In ALAKA the high solid content (cotton, gum and plasticizer) is properly proportioned and balanced. That's the reason for the toughness and durability of the ALAKA film ....the why and wherefore of ALAKA'S superior coverage.

[2]

In ALAKA the solvents are blended accurately with respect to vapor pressure and boiling point. That's what gives ALAKA the proper flow-rate making it spray and dry smoothly without streaking, crazing, gooseflesh, pimples or what have you.

[3]

All raw materials are analyzed by our own laboratory to check their uniform quality in accordance with our prescribed standards. Under scientifically controlled production it is not strange that laboratory tests of ALAKA before it is packed in drums for shipment should prove our point of guaranteed uniformity ....that makes ALAKA dependable, always.

ALAKA gives a finish that wears like an aviator's shoes! ALAKA *sells* your goods. AND KEEPS THEM SOLD!

No rejects, no returns, no red-ink accounts on account of finishing troubles when you're using ALAKA.....the lacquer without a headache for your foreman—at the price you *want* to pay.

Let's prove it. It's easy. Write for samples and put them through the mill... You'll be laughing at lacquer troubles too. Do it today.

Uniform—Dependable—Practical

LACQUER & CHEMICAL CORP.

214-222 40th ST.~BROOKLYN N.Y

CHICAG *makers of* **ALAKA** **PHILADELPHIA**

ness," he says. "Things sell on appearance—on sight. The most insignificant article, if properly finished and with a touch of color, will sell rapidly, whereas in a dull or natural surface it may not attract buyers at all."

We all look for elegance and durability in finish when we buy pianos, furniture or motor cars. These are luxury or semi-luxury items, but when it comes to the seemingly insignificant utility articles used in the household, finish has only recently become a factor.

Even in the stationery line, office fitments and odds and ends in stationery specialties are getting the sales impetus that color or superior finish always provides.

That the consumer is willing to pay a little more for an attractive article cannot be doubted. That the retailer appreciates the sales appeal of color and superior finish —even on the smallest utility articles—is a fact.—E. J. Clary.

Mill Finished Trim and Woodwork

In some places there is evidence of a trend toward the final finishing of interior trim (woodwork) in the mills instead of on the job after it is erected. While as yet, there apparently has been no conflict between the industrial finisher and the journeyman painter, should this practice of using factory-finished woodwork develop to any great extent, there is such possibility.

While this method has been carried out in some places without ill effect, yet the added caution necessary in handling the woodwork by carpenters, the necessity for covering up against dirt and dust, and the necessity of the painter having to patch up damaged places will probably prevent any great spread of this idea.*

It is, however, a good policy for the factory finisher to put on a priming coat and possibly an undercoat in the mill, for this preliminary work not only hastens completion of the job, but gives the factory finisher more to do.—C. D. Youngs.

*Possibly new methods of fastening woodwork and interior trim to walls and openings will dispense with the crude methods now employed in much finish carpentry—rough careless handling of woodwork, crude fitting of joints, driving nails, setting or punching nail heads and filling the punched holes with putty or other paste that later hardens. If so, factory-finished woodwork will be really practical and desirable.—Editor.

OIL-LAC COATER

Cuts the cost 50% to 200% whether using varnish or lacquer finish, for the following places

Inside Radio and Music Cabinets
A Cheap Finish on Novelties
Backing Up Table Tops
A Drawer Coater
Inside China Cabinets
Backing Up Case Goods

Dries in 10 Minutes
A Flat Wax Finish
5 Gallon Sample at Drum Price

The Columbus Varnish Co. Columbus, Ohio

"The
CROWNING GLORY"

In a woman—they say—it's her hair. In good furniture—the finish.

Your product deserves a cloak which bespeaks the goodness of the work and wood that you have put into it. Only with lacquers of quality far above the ordinary can such results be obtained.

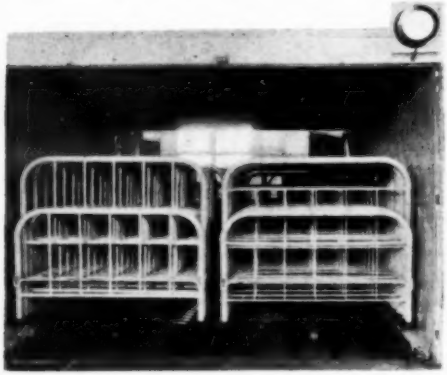
To produce lacquers of this sort— "far above the ordinary"—has been our constant aim. That our customers stay with us makes us believe we have succeeded.

So that you may be convinced, you are free to make your own tests. Won't you do that?

"No Tampering with Quality"

The
ROCKFORD VARNISH
Company

ROCKFORD, ILL.



Industrial Finishing's Field Editor describes and illustrates the metal-cleaning operation and the various finishing, baking and decorating processes which are in use in the finishing department of the Evansville Metal Bed Co.

By P. C. Bardin

FINISHING METAL BEDS

A WIDELY diversified line of metal furniture in various finishes is on the market, among which the metal bed, having a finish duplicating the color and figure design in wood, is an outstanding product. The manufacture of metal beds at the Evansville Metal Bed Co., Evansville, Ind., comprises a full line varying in finish from the ordinary solid-color enameled bed to reproductions of walnut, mahogany and birdseye maple.

Starting in with the tubing and rods, both round and square in cross section, the shearing, bending, boring and assembly operations are completed in one building. In this same department the rails are cut and shaped, and the springs are coiled. Adjoining this room is the spring and rail finishing department containing two dipping vats with drains and the ovens as revealed in Fig. 1, with a third oven (at the extreme left in the picture) where individual spring coils are tempered.

The dipping vats are deep enough and so constructed as to permit an assembled bed spring to be immersed endways and hung by hooks to an overhead trolley which extends into the oven. Notice the drain between the vat and oven in Fig. 1. Black springs are baked 2½ hours at 275-deg. F., while the lighter colors such as blue or gray are baked 3 hours at 200-deg. F.

At top of page: Fig 5—Each oven accommodates two rows of beds, the beds being supported and moved on special trucks like the one illustrated in Fig. 8.

Cleaning; Dip Finishing

As in all metal finishing, the cleaning and preparation of the surface is vitally important. This is done by dipping the assembled parts of the bed in a series of three vats (see Fig. 2) containing cleaning chemicals of various cutting qualities, and hot water. After the final hot-water wash

AIRPLANE FINISHES

. . . . . especially developed to withstand—

Wing Dope"

Excellent penetration; extraordinary adhesion; no peeling; great durability.

A-Lac-O Lacquers

Extremely flexible to withstand climatic changes and vibration.

A-Lac-O Primers

No. 311 Red Oxide (oil base and pyroxylin) for aluminum, duralumine and other metal parts. Quick drying.

Coupon Brings Complete Information

Weather Exposure

Climatic Changes

Excessive Vibration

Handling Abuse

ATLANTIC CHEMICAL CO.

Irvington, N. J.

ATLANTIC CHEMICAL CO. Lacquer A-LAC-O PRODUCTS IRVINGTON, NEW JERSEY

ATLANTIC CHEMICAL CO.
Send Full Information of A-LAC-O Airplane Finishes to:
Firm.....
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State.....

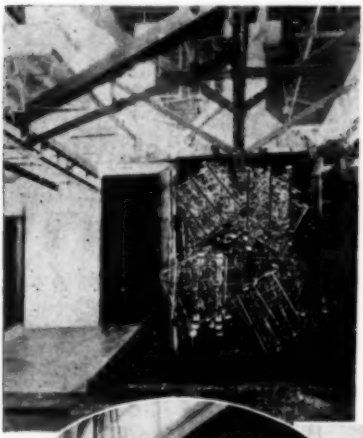
the parts are thoroughly dried.

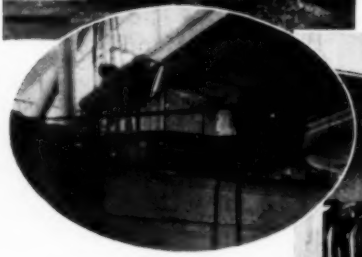
From this point, depending upon the kind of finish the beds are to receive, some of them go to the dipping vat shown in Fig. 3, while others are taken to the spray booths illustrated in Fig. 4. After the application of the primer coat, all beds are baked in ovens each of which accommodates two rows of beds, see Fig. 5. The average baking time is 3 hours at 250-deg. F.

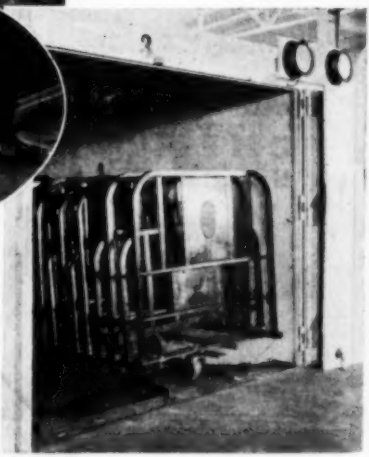
Wood Grain Reproduction

Beds to receive wood grain finish must be sanded, cleaned and given a ground coat which is sprayed on; then the finish is baked, after which the surface is again cleaned and made ready for the graining department. Here the graining color is applied and, through the use of various sponges, graining tools and brushes, the figure design of the particular wood to be reproduced is made. This operation requires exceptionally skilled men in order that a faithful reproduction may be obtained. Two-toning is also done in this department.

The beds are again placed in an oven to be baked, after which they are cleaned, and







Top picture: Fig. 1—Assembled bed springs are dipped, drained and moved into and out of baking ovens with the aid of overhead conveyors.

Inside the oval: Outside view of part of oven, showing fan and heating unit mounted on top, with pipe system for taking in fresh air and expelling fumes.

At right: Fig. 7—Into the baking oven again after "wood-graining," or after the application of some other decoration.

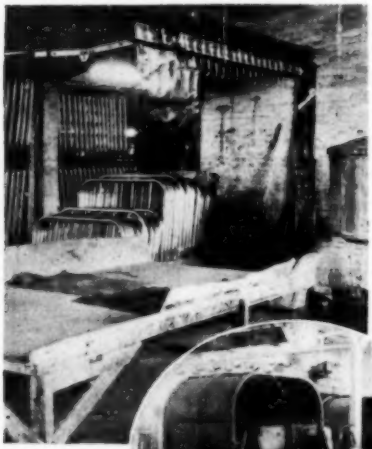
Australian Lace Wood
East Indian Rose Wood
Ebony
Maple Burl
Thuya Burl
Carpathian Elm
Hungarian Ash
Oriental Walnut and
Red Wood Burl
are new designs recently added to the library of the Oxvar Process for the reproduction of wood grain.
Oxford
Varnish Corporation
Detroit, Michigan
Processes patented in the United States and Foreign Countries

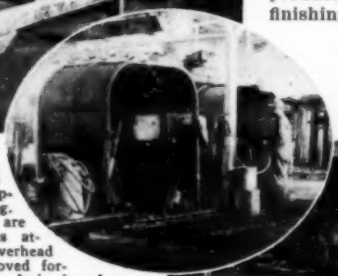
sprayed with varnish, followed by another baking. Any further decoration, such as striping is put on at this time, which requires an additional baking. Then the surface is rubbed and polished.

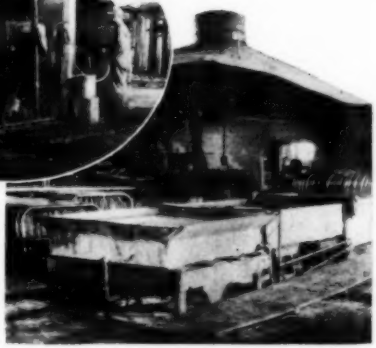
Special Transfer Trucks

The cut marked Fig. 8 illustrates a very necessary, yet simply-constructed truck made of angle iron and tubing; it is used to hold the beds apart after dipping or spraying, while moving from one department to another, and for use in baking ovens. Each truck will hold 16 assembled bed units. This same plan of construction is followed in the stationary storage of beds to prevent any rubbing or scratching of the finished surface.

In the graining department all of the benches are equipped with tubing pins which hold the assembled bed units in a vertical position for the hand graining, striping or decalcomania decoration.







At top: Fig. 3—Where the prime coat is applied by dipping. Dipped beds are hung to hooks attached to an overhead trolley and moved forward over the drain board.

In oval: Fig. 4—Spray booths where some of the finishing coats are applied.

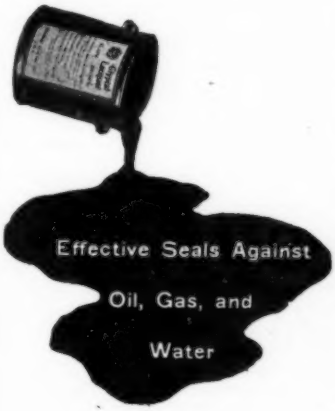
At right: Fig. 2—A series of three vats where the beds are cleaned in chemical solutions and subjected to a hot water rinse.

New Equipment Effects Savings

This company has proved the outstanding value of modern finishing methods and equipment. Prior to the installation of spray booths, all beds were finished in the dip tanks, but now only the lower-priced beds are finished by the dipping process. The higher-priced beds, which form the major part of the production, receive all of the finishing coats in the spray booths.

The former ovens,

Now is the time to learn about G-E Glyptal lacquers



WRITE FOR
test strip and folder

Merchandise Department,
General Electric Company
Bridgeport, Conn.

Gentlemen:

I wish to make my own experiments. Please send the G-E GLYPTAL lacquer test strip and more detailed information about these new protective finishes.

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Section I-6710

GENERAL ELECTRIC No. 1201 red GLYPTAL lacquer, the improved G-E No. 880 red protective paint, is especially recommended to stop oil, gas, and water leaks. It is unsurpassed as a sealing agent for tank seams, pipe lines, motor housings, gas mains, and similar applications. No. 1201 provides effective, lasting protection.

Essentially, all G-E GLYPTAL lacquers have the same distinctive qualities. Besides preventing rust, they resist alkalies, weak acids, salt spray, mineral oils, gasoline, and kerosene; they have high dielectric strength; and they withstand extremely high temperatures without discoloration. Moreover, they adhere to all surfaces, including galvanized iron and aluminum, with an unexcelled tenacity.

G-E GLYPTAL lacquers eliminate priming and sizing operations in the finishing of metal surfaces. G-E No. 1451 filler, recommended for use with GLYPTAL lacquers, possesses priming characteristics. The lacquers themselves function as both primer and sizer.

G-E GLYPTAL lacquers, recently invented by the G-E research laboratories, are now available in five colors: red, blue, green, brown, and aluminum—other colors to follow. Let the G-E Merchandise Distributor nearest you explain more about G-E GLYPTAL lacquers or, if you prefer, fill in and mail the coupon.

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GENERAL ELECTRIC

GLYPTAL LACQUERS

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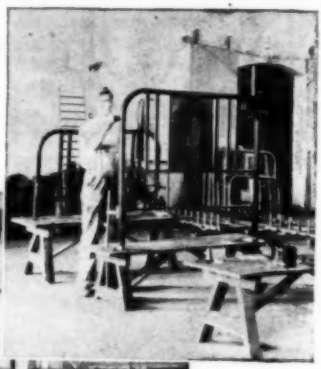
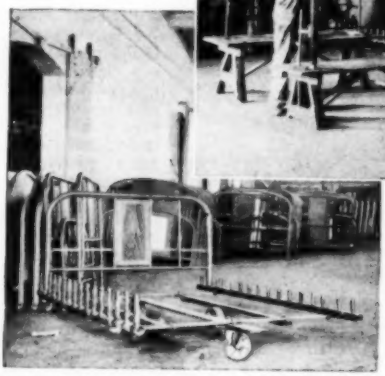


Right: Fig. 5—The wood graining operation is performed by skilled workmen who use tools especially selected for this purpose.

Below: Fig. 8—Close-up of one of the all-iron-and-steel trucks on which head ends and foot ends are placed after the application of finishing coats, and during the transferring and baking operations.



which were nothing more than large "hot rooms" with thermometers hanging inside, have been replaced by the present modernly-equipped ovens having unit-heating systems supplemented by circulated and exhausted air. Although the new ovens take up only half the space occupied by the former hot rooms, an increase in production was made possible through the installation of all modern equipment.

Markers on Thompson Plant Guide Aviators to Landing Field

Thompson & Co., (industrial and technical paints, linseed oil, turpentine, white lead, varnishes and brushes), Oakmont, (Pittsburgh) Pa., has painted large lettered aviation guide signs on top of two of its buildings. One sign carries the city name, another the name of the nearby flying field with a large arrow indicating the direction of the field for fliers.

Thompson & Co., has received a certificate from the Guggenheim Foundation, signed by Col. Chas. Lindbergh, in recognition of this company's service toward facilitating air travel in its locality.

SOMETHING NEW!

The day of rubbing and polishing by hand in production is at an end. Polishing Machines require a specially prepared polish, a polish that will clean, polish and wax in one operation, will highly luster and not injure the surface, AND WILL LEAVE YOUR POLISHING PAD AT THE END OF THE DAY AS CLEAN AS WHEN YOU STARTED. Such a polish is LANDRO'S.

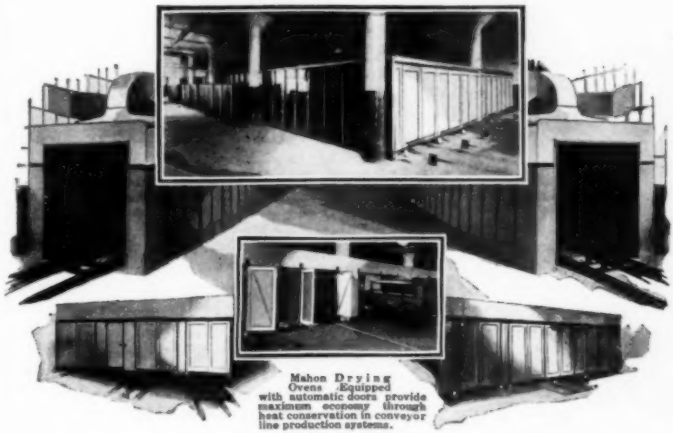
A Trial Will Convince You

Landro - Summers Co., Inc.

12132 Woodrow Wilson **Detroit, Mich.**

OVENS

Any Size or Shape from Standard Insulated Units



Mahon Drying Ovens Equipped with automatic doors provide maximum economy through heat conservation in conveyor line production systems.

The true economy of standardization is realized in Mahon Industrial Drying Ovens. Manufactured in standard insulated units—with all insulation completely enclosed in metal, these ovens provide a two fold economy. The standard unit construction permits erection of ovens of any size or shape with any degree of insulation to meet individual requirements ... the standard unit construction also permits dismantling and re-erecting with 100% salvage. This is an important feature particularly in plants where frequent production changes are inevitable. ¶ Mahon Drying Ovens are fireproof and waterproof ... their rugged construction and the flexibility of standard units provides manufacturers with drying equipment of unlimited utility. Write for complete information ... let Mahon engineers show you the outstanding advantages of standard unit construction

THE R. C. MAHON COMPANY

DETROIT, MICHIGAN

Manufacturers of Industrial Drying Ovens, Spray Booths and Exhaust Stacks, and Blow Pipe Systems.

MAHON

INDUSTRIAL DRYING OVENS

BUILT FROM STANDARD INSULATED UNITS

"The methods used in finishing refrigerator cabinets as outlined in the following are passed on through INDUSTRIAL FINISHING MAGAZINE *with the hope that they will be instrumental in solving the finishing problems of some manufacturer."—*

W. D. Collins
Chief Engineer

ELECTRIC REFRIGERATORS

Chief Engineer of SERVEL, Inc., outlines production methods and illustrates equipment employed in cleaning and drying metal surfaces, dip finishing and spray finishing, drying and baking finish coats, and mechanically handling and transferring liners, shells and assembled cabinets included in the Servel line

By W. D. Collins

THE SUCCESS of an electric or mechanical refrigerator depends upon many things. The refrigerating unit naturally must be highly efficient and of course the cabinet must be designed along accepted lines. Durability of finish both inside and outside the cabinet is an all-important factor. Unlike the average piece of furniture, a modern refrigerator is subjected to almost continuous use—and to both heat and cold, with the added moisture deposit

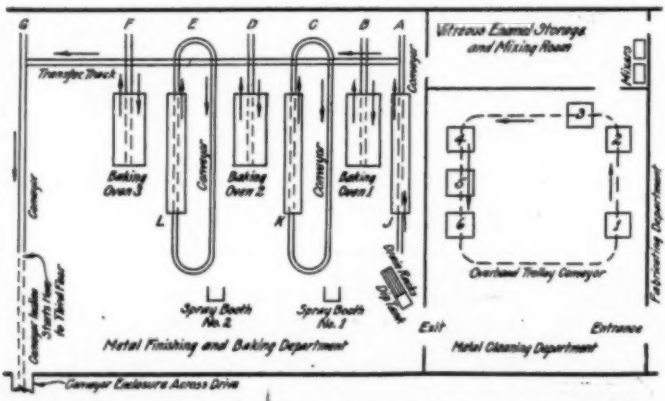


Fig.1—Floor plan layout of equipment in the metal-cleaning and bake-finishing department. Cleaning, rinsing and drying vats are marked 1, 2, 3, 4, 5 and 6; drying ovens, J, K and L; conveyors, A to G inclusive.

Conveyor system booths and drying compartments designed and installed for Cincinnati plant of Ford Motor Co., by Kirk & Blum.

Production Finishing Equipment

The application and drying of finishing materials are fast being placed on an efficient production basis through the employment of engineering principles. Kirk & Blum brings to the finishing branch of industry, scientifically designed and well manufactured equipment backed by ample facilities for rendering prompt service.

Typical Kirk & Blum equipment in the automotive industry covers booths, ovens, conveyors and ventilation, and similar systems adapted specifically to furniture and other industries. We also design and install special booths and handling equipment.

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Pittsburgh Representative: The Bushnell Mchy. Co., 700 Century Bldg.
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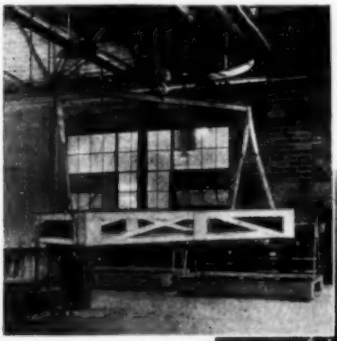
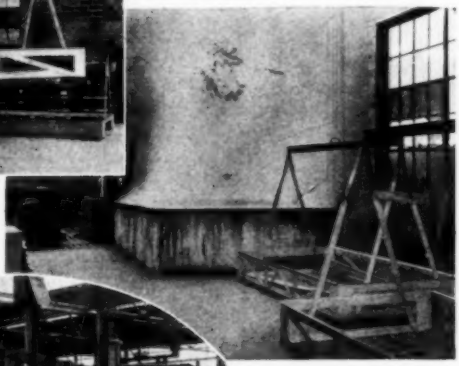
KIRK & BLUM

Industrial Finishing Equipment

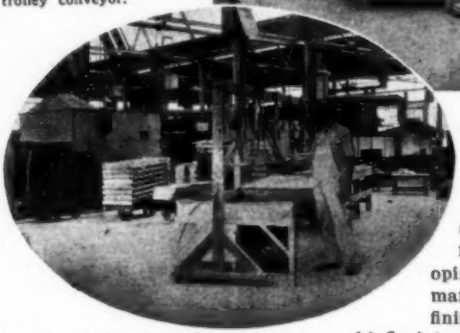


Below: Fig. 3—Vats No. 1, 2 and 3 (see Fig. 1) where metal carriers containing liners are immersed in hot cleaning chemical (No. 1), washed in boiling water (No. 2), and dipped into sulphuric acid (No. 3).

In oval: Fig. 4—Where the liners, just entering the finishing room, are dipped in the ground coat of vitreous enamel and racked to drain.



Above: Fig.2—Liners, entering the metal cleaning department, are placed in metal carriers suspended from overhead trolley conveyor.



on the finished metal surfaces.

Beauty and durability of finish depend largely upon the correct preparation of the bare metal surface, the quality of the finishing materials and the proper application of these materials. Production is obtained through the use of modern equipment, such as dipping and spraying outfits, drying and baking ovens, and mechanical conveying and handling systems.

There are many types of finish used on a large line of refrigerators, and since available space here makes it impossible to discuss all of them, I have selected one class of finish which, in my opinion, the majority of manufacturers of any finished products will be chiefly interested in—namely, vitreous enameled inner liners with lacquer-finished cabinet shells.

Referring to the floor plan layout exhibited in Fig. 1, both metal cabinets and inner liners are fabricated in a department at the extreme right. Leaving this department the cabinet shells are transferred to conveyor line *G* at the extreme left of the floor plan. This conveyor delivers them to the third floor of an adjoining building.

The inner liners enter the

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OIL or GAS FIRED

Most Practical for Such Processes As

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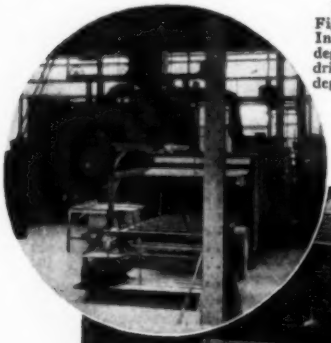
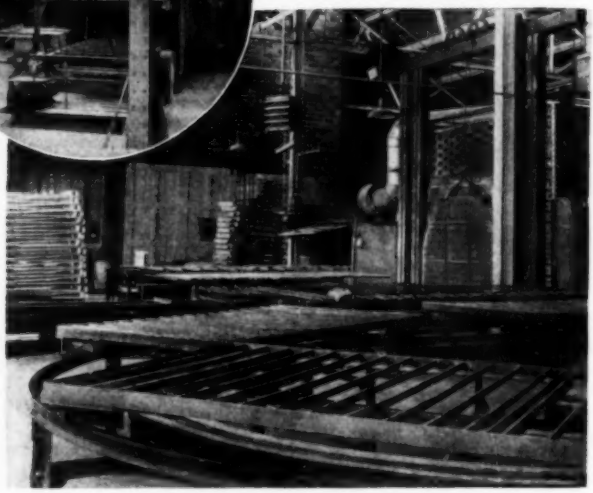


In circle: Fig. 5—The drying oven (J, Fig. 1) on first conveyor line (A, Fig. 1). In background at left of this drying oven (160-deg. F.) is baking oven No. 1 where the pre-dried finish is baked at a temperature of 1600-deg. F. for 2½ minutes.

Below: Fig. 6—In the foreground carriers appear on a hairpin turn in the conveyor line. In the background notice the heavy iron door which closes opening to high temperature baking oven.



metal-cleaning department where they are placed in metal carriers suspended from an overhead trolley conveyor shown in Fig. 2. The loaded carriers travel to the first vat where the liners are immersed in a hot cleaning chemical, then to vat No. 2 where they are washed in boiling water. Traveling to the third vat the liners are dipped into sulphuric acid, followed by a hot water wash in vat No. 4. To neutralize any remaining traces of acid, they are dipped into a hot alkaline wash in the fifth vat, and dried in vat No. 6 which is equipped with gas burners. The first, second, and third vats are shown in Fig. 3.

After being thoroughly cleaned and dried, the liners are inspected and enter the finishing room where they are dipped into the ground coat of vitreous enamel and racked to drain as illustrated in Fig. 4. After draining, the liners are placed in trays on the first conveyor line *A* shown at extreme right of finishing room. Fig. 1 (see also Fig. 5), and travel through the drying oven *J*, where the vitreous enamel ground coat is dried for 10 minutes at 160-deg. F.

Arriving at the rear of this drying oven, the trays are lifted mechanically onto a specially-constructed transveyor traveling

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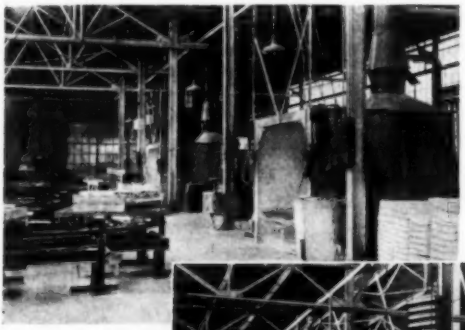
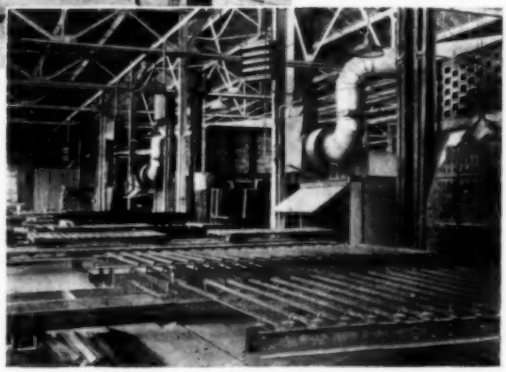
on the transfer tracks, which delivers the liners to a carrier on conveyor line *B*. This carrier and the transveyor appear in Fig. 6. The heavy iron door of the baking oven (see Fig. 6) is mechanically raised and the carrier containing the liners enters the oven (No. 1, Fig. 1) where the articles are baked for 2½ minutes at 1600-deg. F. Due to the presence of cobalt in the vitreous enamel ground coat, the liners are a bluish-purple before entering the baking oven, and a blue-black after baking.

On leaving baking oven No. 1, liners are again lifted mechanically to another transveyor which delivers them to conveyor line *C* where they travel toward spray booth No. 1. On this conveyor the liners are given a stoning operation to remove any foreign matter or rough particles of glass.

In spray booth No. 1, the first white cover coat (vitreous enamel) is applied and the liners are placed back on the conveyor *C* and enter drying oven *K*, where this coat is dried for 10-minutes at 160-deg. F. (same as in oven J). Leaving this drying oven, the articles are again lifted mechanically upon another transveyor and placed on conveyor line *D* and enter baking oven No. 2, where they are baked 2½ minutes at 1480-deg.F. After this baking operation the liners follow through identical operations on conveyor line *E* to spray booth No. 2, (see Fig. 7), where the final coat of white vitreous enamel is applied. This coat is dried in drying oven *L*, (as in the preceeding ovens *J* and *K*), and baked in baking oven No. 3 for 2½ minutes at 1480-deg. F. Leaving the last baking oven, the



Above: Fig. 7—Spray booths No. 1 and 2, as marked in Fig. 1.



Right: Fig. 8—Outlet ends of drying and baking ovens, and in front of them the conveyors and transveyors.

Industrial FESCO *Finishes*

for Metal and Wood

OLIVE GREEN ENAMELS AND GROUND COATS
RUBBING AND FLAT DRYING VARNISHES
CLEAR AND COLORED LACQUERS
UNDERCOATERS FOR LACQUERS

Manufactured in one of the most modern plants in the Industry.
If you have a finishing problem let us help you solve it.
One of our practical men will call at your invitation.

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To accurately predetermine the life of finishes, use the

"Weather-Ometer"

Make sure of the durability of your finished product in any locality, in- or out-of-doors, by testing your finishing materials with this accelerated weather testing cabinet. A thoroughly practical apparatus for tests on paint, varnish, lacquer, bitumens, etc.

Made in three models and three types.
Particulars on request.

Sole Manufacturers

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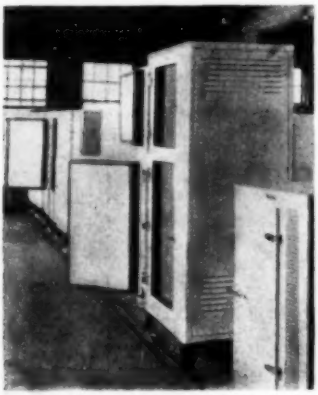
New York Boston Philadelphia London

sixth and last conveyor carries the liners to conveyor line *G* where they are inspected. Perfect liners are conveyed outside the building across a driveway to the third floor of an adjoining building where they are assembled.

The research division, working in conjunction with the chemical laboratory, specifies and tests the various ingredients that enter into the vitreous enamel, all of which are prepared and mixed in the room next to the finishing department. This places full control of both the manufacture and finishing of this very important part of the refrigerator in our own organization.

The metal cabinets or outside shells, as heretofore mentioned, are fabricated, welded together into one-piece units, smoothed and delivered to the third floor over conveyor *G*. In describing this finishing process it becomes necessary to mention some of the assembly and insulating operations in order that the description may be followed intelligently.



On the final trim line.

The first preliminary work includes washing the inside surfaces of the refrigerator shells with gasoline, touching up any rust or rough spots with emery cloth, wiping clean and blowing the surfaces dry with compressed air. Then an oil primer is sprayed on the inside surface of the shell. The primer is oven baked for four hours at 200-deg.F. This operation is necessary to prevent deterioration of the shell by rust.

Following this the legs, casters, and shell are assembled, also the inner liner; then both assembled units enter the insulation line where a lining of 3-in. cork, which has been dipped into hot hydrolene, is placed around the liner and the insulated liner is then entirely encased in waterproof asphalt paper. The shell is then placed around the liner and the top assembled.

At this point any necessary metal work such as soldering, grinding or sanding is done, after which the exterior surface is washed thoroughly with benzine; rust spots and rough places are sanded smooth, after which the surfaces are washed with denatured alcohol and then air dried. Up to this point we have been dealing with separate units, describing them as liners, shells, etc. The assembled units will be referred to hereafter as the "cabinet."

Cabinets are then transferred to a spray booth where an oil primer is applied, after which the primer is baked four hours at 200-deg. F., followed by a sanding with No. 6/0 sandpaper. The next operation is that of spraying on the pyroxylin surfacer. This surfacer is dried approximately four hours, after which the cabinet is sanded, inspected and putty

(Continued on page 89)

45% saving averaged on metal cleaning

CLEANING metal surfaces prior to japanning and covering with imitation leather raised a problem in a certain manufacturing plant. Results were unsatisfactory and cleaning costs were high. A change was made to Oakite materials and methods for removing the oil, grease and cuttings from aluminum, steel and cast iron surfaces. Improvement in the quality of the output was immediately apparent. And a better, cleaner job was produced at an average saving of 45% over the discontinued cleaning practice.

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No time lost when you lacquer—Jonflex hugs close to the job—sticks like old paint and won't slip.

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Lose no time trying it—Your name and company address is worth a one-inch wide, full 36-yard free roll of Jonflex. Send the coupon today.

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Please let me try that free 36-yard roll of one-inch Jonflex Industrial Tape. I. F.—10-29

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This new Willson Product is more than "an ounce of prevention." Although it is only eighteen ounces heavy, it does thoroughly the job for which it was designed. Its efficiency is the direct result of its low weight; being comfortable, it is worn by many men who have persistently discarded other protective devices, complaining that they were not comfortable.

Air is obtained from the air line to the spray gun, filtered to free it from moisture and odors and stored in the rubber container on the operator's back. A dual feed to the face mask assures a constant flow of fresh air which can not be blocked by the operator's turning his head or bending.

Exhaled air is immediately disposed of through aluminum ports at either side of the mask. A union in the supply line allows the quick separation of the breathing apparatus from the gun and air line.

If you require further information, ask your dealer or write direct to Willson Products, Inc., Reading, Pa., specifying make of spray gun to be used. Price, $25.00 complete, f. o. b.

WILLSON PRODUCTS, INCORPORATED
Reading, Pennsylvania

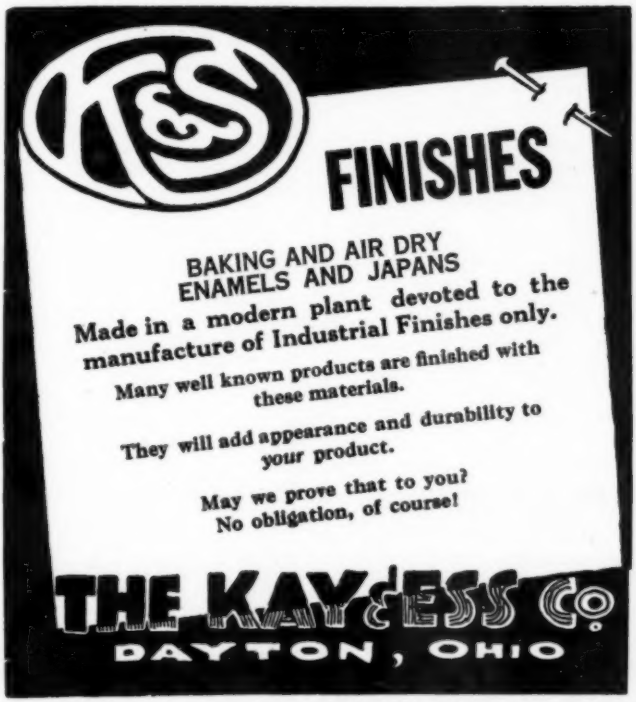
glazed, the workmen using a flexible knife for this purpose.

After the putty has dried about one hour, the cabinet is lightly sanded, blown clean and the first coat of white lacquer is applied. In about an hour the cabinets are given the second spray coat of white lacquer. I might mention at this point that great care is exercised to mask the vitreous-enameled liner from sprayed lacquer as the lacquer odor will penetrate food placed in the refrigerator.

Following the final lacquer coat the liners are thoroughly washed and the cabinets are placed on the trim lines where hardware is applied and doors are hung. This is followed by inspection, touching up and final inspection.

The doors go through the same finishing operation as the cabinets, and just prior to entering the trim lines, rubber gaskets are attached to the flanged edges of the doors.

An interesting feature of some of the colored jobs is the veiling operation. Cabinets finished in the desired colored lacquer are placed in a spray booth and the contrasting color veil is applied with the spray gun; then the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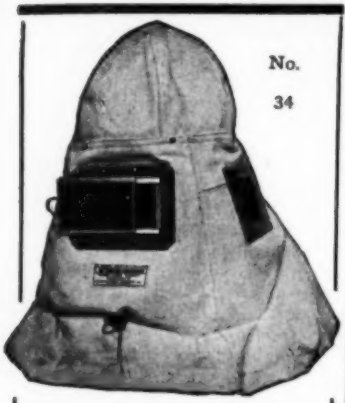

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PULMOSAN Sand Blast Helmet No. 34. A tough, practical helmet of 12-oz. Army duck, yet *comfortably light.* Furnished with wire screen or glass fronts (as specified). Fronts can be removed without discarding helmet.

Send Coupon for Details of this and other types

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SAFETY EQUIPMENT CORP.
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Kindly send details of your Sand Blast Helmets.
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cabinet is immediately wiped (very lightly) allowed to air dry and when dry, it is given a coat of clear lacquer. This operation requires the utmost care of a skillful operator, as the cabinets and doors come through separately, and while it is not difficult to match a solid white job, it becomes a delicate operation in a colored job that must be evenly veiled.

New Automobiles in Black With Color Stripes

Several leading automobile manufacturers are finishing some of their 1930 cars in black—not the conventional dull finish of a few years ago, but a bright brilliant finish, with just a touch of color in the form of one or more thin narrow stripes. This thin stripe breaks the monotony of a solid color, and gives the car a smart distinctive appearance.

One of the handsomest of these new cars is a solid brilliant black. set off with a thin narrrow stripe running the full length of the body and hood, and then following out the lines of the hood on top. The fins on the radiator hood are also finished off with just a touch of white on each fin. This makes one of the smartest and most attractive automobiles on the road today; one can readily see that automobile buyers are welcoming back the cars finished in black. judging by the large number of orders placed for cars finished in this color.

This modern black is a distinct contrast from the wide range of colors which have now become so common. One has only to see these smart new cars dressed in black and set off with white stripes, plus a wealth of chromium plated parts, to appreciate their real beauty.—A. J. Owen.

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SINCE 1890 we have made only superior quality lacquers, because inferior quality is always disappointing, no matter how cheap it may be.

No great success was ever made with an inferior product. That is one reason we don't make it.

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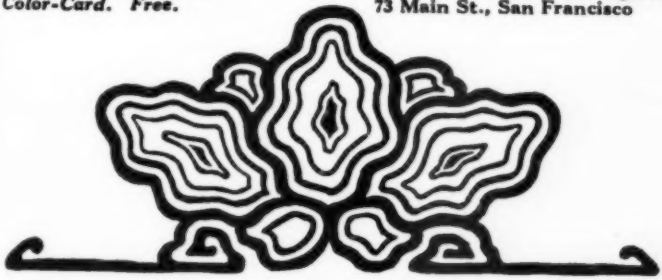

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Another Plater's Problem Simplified By Protecting the Racks With M & W Waterproof Rack Enamel.

You will be interested if you are Doing Chromium Plating. May We Send You Further Information?

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QUESTIONS AND ANSWERS

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Heating the Finishing Room Only

We are looking for some means of heating our spray room, which is about 20x20-ft. with glass roof.

Our building is equipped with steam for heating only. Naturally we do not care to run the heating plant, especially for the spray room, during the early fall and spring. Again, during the bitter cold weather we have trouble keeping the finishing room at the proper temperature.

Our insurance does not allow an open flame in the spray room, as we use lacquer, so this rather eliminates gas. The solution may be arrived at by electric heat.—F. & H. Co.

We believe the solution of this problem will be the installation of an electric unit heater, of which there are several makes for industrial use. This unit heater could be placed in an adjoining room and the heat piped for short distance, so as to have the hot electric bars outside the finishing room. Both the intake and discharge ends of the unit heater should be screened to filter the air of any dust or dirt and, of course, an electric fan will be incorporated in the unit heater to move air through the heater bars and blow it into the finishing room effectively. An outfit of this kind will occupy comparatively small space and will probably comply with any fire insurance requirements. Clean, safe heat is always available at the push of a button and it is easily controlled to suit conditions.—I. F.

Heating Enamel

What benefit (if any) is gained by heating enamel in finishing chairs, etc? I have tried the enamel heated and I have used it at ordinary room temperature and found the finish just as good, in fact better. Still, I have been advised to heat this enamel. What is your opinion?—P.N.

There is some difference of opinion among finishers as to the advisability of heating enamels, varnishes, etc., for finishing. The reason for this is found in the great difference in conditions in the various plants and their localities; also in the room temperatures and the location and arrangement of the finishing rooms.

In some plants, heating the finishing materials is not necessary owing to the fact that air in the finishing department is kept at an even temperature and comparatively uniform humidity. But in

What Every Finishing Foreman Requires

Jamestown's No. 2798
Lacquer Primer

Pale in color
Lays smooth
Does not lift
Sands easily
Dries quickly
Full body
Seals perfectly
Transparent

Jamestown Wood Finishing Co. products are guaranteed. If they will not do for you what we claim for them your money will be refunded.

Stains — Fillers — Shellacs
Varnishes — Lacquers — Enamels

Jamestown Wood Finishing Company

MAIN OFFICE AND FACTORY
Jamestown - - New York

BRANCHES
Bristol, Conn. Lenoir, N. C.
Milwaukee, Wis. New York City

other plants, where conditions are not so favorable, heating is often resorted to and used with good results.

If unsatisfactory results are being obtained in using enamel, the following may be the cause and should be checked first:

1—Too heavy material.
2—Too low an air pressure.

One finisher recommends at least 80-lbs. pressure for spraying enamel, and has varied this to as high as 110-lbs. at various times with different materials to obtain the desired finish.

If enamel (and the same holds true of varnishes) is stored overnight in a cold place, some gradual and mild heating will be necessary before it is in suitable condition for use next morning, but if the enamel has been left in a warm place (such as near steam pipes) it will probably require no heating whatever. The temperature of the room should be from 65 to 75-deg. F. and the finishing material and the articles to be finished should be of practically the same temperature.—E.H.D.

Finishing Wood Fiber Carvings

We will appreciate some suggestions toward securing a satisfactory finish on wood fiber carvings after they are applied on walnut veneered furniture.

We have used several wood fiber carvings and, in finishing them the same as the wood on which they are applied, we find that the carvings have a "stony" appearance and look too glossy when finished with varnish, even though this varnish is rubbed to as dull a finish as possible.

We presume that better results

Clearcote

Replacing pure shellac and shellac substitutes, this new clear First-Coater is exceptionally economical for use under Varnish or Lacquer. ¶ Adapted for high-speed production, it brings out the full lustre of the finish, and will not bleed or discolor stains. ¶ It is durable and easy to sand.

● Industrial Lacquers — Varnishes — Enamels

MAYER & LOEWENSTEIN

43-43 VERNON BLVD. LONG ISLAND CITY N. Y.

ESTABLISHED 1846

could be obtained if the carvings were finished differently than the wood, but this probably would add to the finishing expense. In order to get production, it is our method to stain, fill and varnish the carvings just the same as we do the wood, and we would like to continue this method of finishing, with any suggested change that would kill this objectionable glossy and "stony" appearance.—P. C. Corp.

There are several different things that could cause the fiber carvings to look "stony" after they are finished. As stain cannot penetrate into this fiber, it stays right on top.

Apply the stain in the regular way but, when filling the cabinet, do not fill the carvings as there are no holes or pores in such fiber material to receive the filler. If the filler is applied on the carvings and then cleaned off, the stain comes off with it.

I presume this cabinet work is looked over and toned up before the first shellac coat, or whatever the first coating may be. To match the carvings with the wood, a spirit stain (walnut) of the cabinet color should be used to tone them up. After the cabinet work is finished, instead of rubbing the carvings, purposely rub around them carefully. After the rubbing is completed just hit the carvings lightly with pumice stone and oil and they will be as dull as the rest of the cabinet.

If fiber or composition carvings are rubbed and ragged off like the rest of the article they will become highly polished. Carvings of this nature are like stone, particularly marble—the more rub-

EASY NOW TO REPAIR DAMAGED FINISHES

Permanent repairs are easily and quickly made with Campbell's Stick Shellac. No use to lower prices because of damage—or to incur big expense of refinishing.

CAMPBELL'S STICK SHELLAC

Campbell's Stick Shellac easily restores scarred and scratched finishes to perfect condition. It is melted into the hole, dent or scratch and then rubbed down and polished. It is truly an ideal way to economically repair damaged finishes.

UNIVERSALLY USED

A color card of Campbell's Stick Shellac will be sent free to anyone upon request. Shows actual samples of the Shellac and the range of 54 different colors. Write for one today.

The M. L. CAMPBELL CO.
1007 W. 8th St. Kansas City, Mo.

RESTORING VARNISH
Will Save The Old Finish

Knitteen

FOR CRACKED VARNISH

Brushed on over the old varnish scientifically "knits" and welds the old varnish together, closing all CRACKS and CHECKS permanently, at the same time brings back the life, color and beauty of old varnish on fine
Furniture, Cabinets, Pianos, etc.
A gallon will cover 400 sq. feet
PRICE $5.00
Trial quart sent postpaid $2.00 Full Instructions
The Corlear Products Co., Inc.
1303 North 27th St. Philadelphia, Pa.

bing the greater the polish, and this polish is very hard to kill.

I want to mention the fact that the carvings must be dry before the stain is applied. Most of the carvings of this type are held in steam and heated to make them soft before they are attached. If the work goes to the finishing room and is stained before the carvings are dry, they will not have a uniform color, the stain will spot and oftentimes will turn green on them.—T. R. Nall.

Tumble-Finished Turnings

Some time ago you published something on the finishing of wood handles in tumbling barrels. We have been experimenting with this process for some time and have just reached some definite conclusions. Two handles are being sent to your office for your inspection.

It is our conclusion that the first coat can be placed on the handles by means of rolling them in a tumbling barrel with a lacquer solution. It is shown by the handle that has the first coat on it, showing the grain of the wood well covered but not entirely hidden. (The harder layers and flakes of hardwood grain show through in a clear natural effect which contrasts attractively with the more deeply impregnated solid-color covering over the major portion of the turned handles).

The other handles in light blue (solidly covered with no grain effect showing through) has the final coat on. This is dipped. It is our understanding that it usually takes three or four operations in order to obtain the proper finish on the handle. If this method we followed is satisfactory, the handles can be coated in

two operations, thereby saving considerable labor and material.

We are sending these two handles to you so you can determine whether this process would be satisfactory and whether you desire to have any more information about it.—The Globe Machine & Stamping Co.

Sand and Soda Fire Extinguisher

In July issue, the article by Mr. M. V. Leach entitled, "Precautions Against Fire," contained, among other valuable suggestions, some mention of a sand and soda box. Being always on the lookout for additional protection against fire, I was wondering if it would be possible to give me the proportion of soda to sand, so as to give the best results; also the kind of soda used.—C. R. A. Co.

The use of a sand and soda box as a precaution against fire, while admittedly a good suggestion, is not so much in general practice since there are so many excellent portable fire extinguishers now on the market. As to the proportion of soda to sand, there is no set amount to use—the important part is to have the soda well mixed with the sand.

Bicarbonate of soda is used in commercial fire extinguishers and would obviously be of value if used with sand to give it body and covering properties.

In using this fire extinguisher the flames should be attacked first along the outside edge to cut the flame and smother it from the surface to prevent spreading.—E.H.D.

Most information on the soda and sand box simply states "soda

First See Watson's New Catalog

Quality products, low prices, and prompt service are what painters and decorators always get at Watson's. Customers come back regularly and that's good proof that we treat them right.

Send for our latest illustrated catalog, giving prices and complete information. It took an extra edition to supply requests for our last catalog. Mail the coupon below today.

Black Oval Chiseled Varnish Brush

Made with best Chinese black bristles, chiseled to a fine flag end. Nickel ferrule. Nos. 5-0, 6-0, 7-0, and 8-0, are bridled.

No.	Hair	Doz.	Each.
1-0	2-5/8 in.	$5.80	$0.55
2-0	2-3/4 in.	6.53	.65
3-0	3 in.	7.95	.75
4-0	3-1/8 in.	9.43	.90
5-0	3-1/4 in.	11.27	1.10
6-0	3-3/8 in.	12.35	1.20
7-0	3-1/2 in.	14.00	1.40
8-0	3-5/8 in.	15.95	1.55

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"The Paint People"

164 W. Lake Street Chicago, Ill.

Please send me your new catalog on painters' supplies.

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and sand," so I have been of the opinion it was regular keg soda or bicarbonate of soda. One magazine article that I keep for reference on this subject gives "sand, soda and sawdust." I prefer to leave out the sawdust for, in a wet lacquer fire, the sawdust might absorb some of the solvents and burn.

Recently I tested salt and soda on some lacquer which I placed in a pan and set on fire; when the salt and soda was thrown over half of the burning area, this part immediately ceased burning. The salt and soda seemed to absorb the unburned wet portion of lacquer and this failed to burn or ignite from the flame of the uncovered burning lacquer.

Another test consisted of completely covering an ignited pan of lacquer with salt and soda. This put out the fire. The salt and soda was absorbed by the remaining unburned lacquer and, while the mass seemed very wet, it would not support flame when a burning match was touched to it.—M. V. Leach.

Editor's note: Evidently the proportion of sand to soda is "half-and-half," or something near this.

New Materials and Equipment

Presenting briefly, certain outstanding features of new materials and improved equipment which have been developed for use in modern industrial finishing departments

30-Minute Wood Filler

E. T. Stille & Co., 2343 Greenview Ave., Chicago, Ill., announces a quick-drying wood filler which has been given the name "Spee-D-Dry." According to information supplied, this material was developed more than 18 months ago, but information about it has been purposely withheld until its merits and quality had been proved and tested in actual service over a reasonably safe period of time.

Quoting from literature on the product: "Spee-D-Dry penetrates the deepest pore. It will not pull out of the pores. It fills them and they will stay filled until the article wears out. It does not raise the grain. Sanding down is not required. It doesn't shrink or crack. It is as hard as flint and as smooth as glass. It can be obtained in any color, transparent and natural . . . . not expensive. After surfacing, sanding, etc., the filler is applied in the same manner as any ordinary filler. In three minutes it is wiped off. In 30-minutes it is thoroughly dry—ready for the primer coat."

All-Purpose Spraying Outfit

The Electric Sprayit Co., 320 E. Colfax Ave., South Bend, Ind., announces the new All-Purpose Model Electric Sprayit to round out its line of hand portable spraying equipment. This new model

DON'T JEOPARDIZE YOUR GREATEST ASSET

A COMPANY'S greatest asset should be its reputation. Its reputation, of course, rests on the quality of the goods it sells. And the quality of its products, in turn, depends on the kind of materials put in to them.

Use Pure Shellac. It is worthy of the highest reputation.

As a sealer, a filler, an undercoater or a finisher, Pure Shellac is unequaled. It reduces to a minimum the hazard of returned shipments, spoilage claims and other similar losses that can cut so heavily into profits. Pure Shellac more than pays its way by the losses it prevents, to say nothing of the increase in profits it makes possible.

Avoid the so-called "substitute" shellacs and sealers of today that live on the good reputation of Pure Shellac but are more expensive in the end. A Pure Shellac finish never comes back to the factory. There is nothing experimental about it. Make sure the shellac delivered to your door has the word "Pure" —Pure White Shellac or Pure Orange Shellac—on its label.

The word "Shellac" standing alone on a label may mean little. But "Pure Shellac" on an Association member's label means that his product has not been adulterated.

American Bleached Shellac Manufacturers Association, 330 Seventh Avenue, New York, N. Y.

THERE IS NO SUBSTITUTE FOR

PURE SHELLAC

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was designed to meet the growing demand for a moderately-priced hand portable sprayer with a pressure feed container suitable for covering wide surfaces quickly

This outfit includes a compressor driven by a ¼-h. p. electric motor.

and for all types of commercial and production work that can not be handled advantageously with a cup gun outfit.

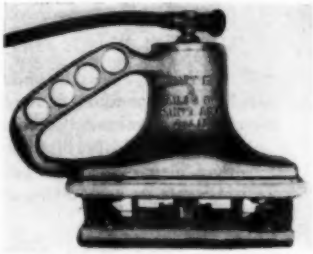
The All-Purpose Electric Sprayit consists of a sturdy rotary compressor of special design, operated through a direct drive by a ¼-h.p. motor. The compressor delivers a constant unvarying air volume of 5-cu. ft. per minute. This high volume of air does away with the need of an air storage tank. The pressure feed tank holds approximately two gallons of material which will cover about 700-sq. ft. of surface. A one-quart container is also furnished and can be quickly connected to the gun for small touch-up and trimming jobs. A highly efficient commercial gun completes the equipment.

The complete outfit weighs approximately 50-lbs. and can be readily carried to any job. Twelve feet of electric cable and 20-ft. of rubber hose between the compressor and the container makes any job easily accessible. Longer cable or hose can, of course, be used. Eight feet of air and paint hose connect the gun to the container. Special attention has been given to the matter of excessive mist or fog and this objectionable feature is said to have been eliminated.

The All-Purpose Electric Sprayit is also furnished with a gasoline engine for use where electric current is not available. This self-powered unit is of the same compact design as the electric model and weighs approximately 70-lbs. A ¾-h.p. air-cooled engine of high efficiency was designed especially for this service.

Air-Motored Portable Sander

The Robart Mfg. & Sales Co., 2024 E. Seventh St., Los Angeles, Calif., declares that the Robart flexible sander, which it has developed, "takes the labor out of



Sands pyroxylin or oxide undercoats—wet or dry—without balling paper or scratching surface. Operates on 5-cu. ft. of air per minute at 100-lbs. pressure. Weight 5½-lbs.

all hand sanding operations," and "its flexibility permits of sanding any contour." According to the company's circular, the construction features are as follows:

1—The spline shaft of chrome nickel steel against a tobin bronze crank arm insures long life.

2—The impeller arms are lined with elk hide, a very durable leather which stands up under the hardest kind of usage.

3—The valves and valve seats are brass, eliminating the possibil-

HOUR-COAT

An
Enamel and Undercoat combination that dries in two hours.
Thins with benzine or gasoline
Made in all colors
Covers better than oil undercoats or enamels

Also SEALING COATER

A clear first coater and sealer
Dries in one hour
Thins with benzine or gasoline

Write us for samples and prices
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Manufactured By

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Will not

Bleed or Fade
Raise the Grain
Blister Veneers
Loosen Glue Joints
Rub Off Under Filler

Try it!

It's....

WATEROIL

REG. U. S. PATENT OFFICE

The Latest Achievement in WOOD STAIN

.... water color definitely dissolved in oil! The use of WATEROIL Stain entirely eliminates the usual difficulties found in water colors.

WATEROIL may be sprayed, brushed or dipped. Regularly furnished in four standard colors: light and dark walnut, red and brown mahogany. Allow us to prove to you that WATEROIL is really the stain to meet your requirements.

Fully Guaranteed — Try It Out!

V. J. DOLAN & COMPANY, Inc.

Wood finishing materials of "Unquestionable Quality"

1830-32 N. LARAMIE AVENUE CHICAGO, ILLINOIS

Six-Fold in Three Years!

Of course there *must* be a reason for our volume of business increasing SIX times since 1926. We prefer to believe that there are many reasons, and our present list of large and famous manufacturers using our varnishes and lacquers bears out our belief.

Whether you work in wood or metal we have most probably developed for some specific purpose in your field a varnish or lacquer that will eliminate any bugbear of imperfect quality or too high a cost that may now annoy you.

Those who have believed us in the past must have been satisfied—for they remain our friends and customers.

We are prepared to offer you the same complete, competent and friendly service when you give us the opportunity.

THE Joseph F. Glidden FOUNDER AND PRESIDENT VARNISH PRODUCTS CO

12900 Berea Road
Cleveland, O.

ity of rust and the necessity for passing air from main supply through a filter.

4—The outside shell is of heavy aluminum alloy, tough and durable.

5—The air exhaust is so located that it prevents collection of all dust and grit upon any bearings or bearing surfaces.

For the care of this machine the following points are emphasized:

1—When used continuously, the machine should receive two or three drops of oil per hour; in intermittent service, one oiling each day is sufficient.

2—At frequent intervals the rubber oscillating sanding pad should be removed from the frame, and any excess oil and water cleaned from the pad and bearing.

3—The bearing is dustproof and packed with lubricant for one year.

4—Rubber pad can be changed quickly by lifting off lift-a-dot fastener on inside of pad with a screwdriver.

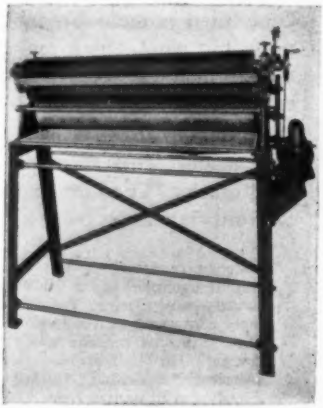
5—Air valve will open with two turns.

6—Occasional sticking of the pad after turning on air is characteristic of this type of power unit, but by pressing down on the center of the pad, the machine will start immediately.

Operation information: The tool can be handled from any angle with perfect ease; operates at 3600 oscillations per minute. The 23-sq.in. of cutting surface on the flexible pad, traveling at 200-f.p.m., keeps the paper free from sanding particles. Any grade of paper may be used, and it will be noted that the machine will use one grade heavier paper for any operation than is customary by hand sanding. Performs polishing jobs with

The NAZ-DAR Coating Machine

—the answer to a long felt need for a practical coating machine that could be obtained at a reasonable price.



Uniformly coats oil paints, enamels, varnishes, lacquers, etc., on practically any surface—process, news, chip, card or wall board . . . tin, metal, wood, glass, and similar sheet materials.

A uniform coating of any desired thickness is deposited at great speed. At full capacity will coat at least 1200 sheets 30 x 40 per hour. Will exceed in one hour, full day's production by old screen coating process and in many instances will more than double production and eliminate an entire operation over spraying, dipping, etc.

Of simple but sturdy design; quick adjustments; unique automatic fountain feed; interchangeable rollers; requires no special wiring; quiet in operation; easy to clean; portable.

Write today for price—and fully illustrated circular.

NAZ-DAR COMPANY
4014 N. Rockwell St. Chicago, Ill.

Is Pure Shellac Always Pure?

The percentage of Shellac Gum used is undoubtedly pure, but what about materials such as Rosin and other Alcohol soluble gums? Why not insist on protection against this form of adulteration? The following warranty is your protection.

"We guarantee the material in this package to be strictly pure Shellac Varnish, composed of Shellac Gum cut four pounds to the gallon in No. 1 Special Denatured Alcohol 190 Proof, and to be free from Rosin, added Wax, excess moisture, dirt, or other adulteration.

Clean as a Hound's Tooth"

If it were possible to make this guarantee stronger we would gladly do it.

Try Strictly Pure Shellac Just Once—You'll Always Use It.

Look for our guarantee label on the package. Prices on request.

Barrett Varnish Company

1532 South 50th Court Cicero, Ill.

comparatively little effort and insures an honest luster which is commercially permanent. In placing cutting felts and sheepskin polishing pads on machines, follow the same proceedure as for paper.

Clear Crackle Lacquer

In announcing the above named product, the Wabash Products Co., (lacquer specialists), Terre Haute, Ind., declares that a perfectly transparent crackled finish is produced when this material is coated over another finish. It finds its application in the antiquing of woods, pictures, prints, etc.

A ground surface is built up with either colored or clear lacquer. A coat of clear lacquer follows much in the same manner as ordinary colored crackle is applied. The best results are obtained when the materials are applied by the spray method.

The cracks may be brought out more distinctly by rubbing on dry color with benzine; dark greens produce the desired antique effect.

Presto Electric Sprayer

Metal Specialties Mfg. Co., 338 N. Kedzie Ave., Chicago, Ill., announces a new spraying outfit which is called the "new Presto Floor Type Electric Spraying Unit, Model 84" for applying paints, varnishes, enamels, lacquers, bronzes and shellacs.

The company declares that:

"In the designing of the Presto 84, particular attention has been given to complete atomization and high-speed application of the materials being sprayed.

"The new motor-driven air compressor gives a large volume of air and high pressure, which makes for fast painting. The unique nozzle design provides

"Wears Like Flint"

Courage

When a business is founded it takes considerable courage to establish really high ideals—and it takes even greater courage to cherish and live up to these high ideals for half a century of service.

And we believe that it is this very courage which has won the life-long confidence of our customers, many of whom have been on our books for over twenty-five years.

We specialize particularly in Lacquers; Clear, Rubbed Effect and Colored.

And in Paragon Rubbed Effect Varnishes: Flat, Velvet and Semi-Bright.

Our corps of long experienced specialists are always ready to help you obtain the most satisfactory results at a low unit cost.

Your Problems are Our Business

THE CLEVELAND VARNISH CO.

3111 East 87th St. Cleveland, Ohio, U. S. A.

Stille's SPEE-D-DRY

The THIRTY MINUTE FILLER –

A proven article -- time tests successfully passed during last 18 months.

Manufactured by
E. T. STILLE & CO.,
2343 Greenview Ave.,
Chicago, Ill.,
Southern Ofc. and Factory,
High Point, N. C.

Stille's Free Trial Offer

Send for a 5-gal. can of SPEE-D-DRY Filler and a can of SPEE-D-DRY Solvent. Use sufficient to give it a thorough test. If it does not dry as hard as flint in 30 minutes, if it does not answer every demand of a quality filler, return the unused portion of the can to us and full credit will be allowed without quibble or question.

Your Particular Shade

In Water Soluble Powders
For Water Stains — Or
The SAME COLORS In
Non-Grain Raising Stains —
Without Water

Dakalite Products Co., Inc.

Minot
North Dakota

13,000 Athens Ave.
Cleveland, Ohio

complete internal atomization, reduces evaporation of the solvents, minimizes the amount of mist and rebound of the materials

Presto Electric Spraying Unit

sprayed, and produces the same quality finish obtained with the latest standard industrial finishing equipment.

"In addition, double filtration of the air, in the handle of the gun and in the base of the compressor, serves to remove every particle of dust, oil and moisture, assuring clean, dry air always.

"There are many other features in design for the convenience of the operator such as the new clamp-on can cover, and pistol grip handle with gun trigger. The nozzle caps produce either fan spray or round spray as required."

Masking Paste

The Atlantic Chemical Co., 1186 Grove St., Irvington, N. J., (lacquers, surfacers, thinners and primers), announces the develop-

To Manufacturers of Radio Cabinets

Are you producing to the limit of your plant production?

Is your finish satisfactory in appearance? What does it cost per square foot?

We are in excellent position to help you analyze your conditions—both as to production and finishes—with a view to increasing production and lowering costs. Write, wire, or phone.

BRADLEY-HURTZ CO.

2626 S. Dearborn St.
Chicago, Ill.

ENAMELS LACQUERS INDUSTRIAL PAINTS VARNISHES

New type—ultra modern "Air Exit" Ventilating and Drying Fan . . . . 2 to 6 blades

Aeroplane Propeller fan blades are universally recognized as the most efficient and economical . . . and the blade which our engineers have designed and developed (constructed of Nickel Alloy Aluminum) is practically perfect in these respects.

Note exclusive motor bracket—gives better frame support and can be adjusted to fit any motor.

Write for price and descriptive circular. . . . . you'll be surprised.

AIR-MORE PRODUCTS CORP.
3402 Northwestern Ave. Indianapolis, Ind.

Style No. 77

Style No. 77 is a light weight chemical cartridge respirator designed for protection on all operations where injurious or obnoxious vapors or gases are encountered. Especially developed for paint spraying. Made of aluminum with a soft molded sanitary cushion to fit snugly against the face. There is real comfort and protection in the No. 77. Price $4.50 each.

CHICAGO EYE SHIELD CO.
2300 Warren Ave. Chicago, Ill.

ment of "Lackermask," a patented method and formula for blanking or masking out colors, letters and designs. Lackermask is a non-drying, non-solvent liquid material.

The method in brief is as follows: Suppose it is desired to have a simple sign of white letters on a black background; the metal is first given a spray coat of white lacquer; then the designs and lettering to appear permanently are applied with Lackermask paste. Then the entire sign is given one or two spray coats of black; allow about ½ hour for drying and then remove the Lackermask paste with a sponge and water.

If the sign is to have several colors, the same process is followed, leaving all of the Lackermask on the sign until the final coat of the colored lacquer of the shade desired is applied. All of the Lackermask is then removed together and the various colors that have previously been masked or blanked out will appear.

Many beautiful effects are being obtained in the production of signs and the lettering of trucks and automobile bodies with this method.

Sunproof Clear Lacquer for Light Woods

In a recent announcement of newly developed lacquers, the Wabash Products Co., (lacquer specialists), Terre Haute, Ind., states that:

"As a result of many complaints by various furniture manufacturers using the silver oak finish, we are pleased to announce a non-yellowing clear lacquer which does not discolor upon exposure to sunlight. This new material can be purchased in either gloss or flat

Making a good Finish **Better**

To improve markedly the seal of the wood and the body effect of the final finish

Use—

No. 125 Sanding Sealer

No. 90 Flat Lacquer

THE SCHAEFER COMPANY

Manufacturers of Lacquer and Varnish

1315 W. Kentucky St.

Louisville Kentucky

Kindly mention INDUSTRIAL FINISHING when writing advertisers

Carlsen Sealer Coat

. . . . . *the speedy quick sanding coater for wood!*

APPLIED over stains, fillers or bare wood as an undercoat or surface coat before application of varnishes or lacquers, the Carlsen Sealer provides a full and heavy film that insures a rich, satisfying, enduring surface on the finished product.

We will be glad to submit samples for your approval or demonstrate the Carlsen Sealer in your own plant without cost or obligation, simply to prove that it will do all we claim for it, that it will lower your finishing costs, provide a better finish and sustain your reputation for attractive, high-grade products.

Free trial or will demonstrate without obligation. Write us TODAY!

John G. Carlsen & Co.

Varnishes—Lacquers—Enamels

1446 W. Kinzie St., Chicago, Ill.

This Portable Spray Unit Only $59.50 (With Air Compressor)

THE U. S. Spray-All Painter is sturdily built and includes an air compressor that delivers the steady air pressure so necessary to completely atomize paint materials and produce smooth paint jobs. It should not be confused with makeshift toy outfits that operate as vacuum blowers, and have no air compressor. This spray unit weighs only 46 pounds, and may be easily carried to any part of the plant where there is painting to do. The U. S. Spray-All Painter is ready to plug in a convenient light socket. It has 15 feet of braided air hose, 10 feet of lamp cord; no accessories needed.

U.S. AIR COMPRESSOR COMPANY

5320 Harvard Ave. Cleveland, Ohio

Manufacturers of Air Compressors, Heavy Duty Paint Spray Units, Car Washing Systems and High Pressure Grease Guns

finish. Its properties such as body, coverage, flow, blush resistance, toughness, elasticity, etc., are entirely satisfactory for the requirements of the furniture trade and other industries using finishing materials in a similar manner."

Four-Hour Varnishes

In line with the reputation of the paint and varnish industry for developing new products, there is now obtainable a varnish which will dry hard in four hours or less—according to atmospheric conditions outside, or drying conditions in the factory. It is suitable for either outside or inside exposure.

The development of nitrocellulose products was a severe blow to the varnish-making industry, and most of the varnish manufacturers turned to the development and manufacture of lacquers. However, it seems as though this development of four-hour varnishes is a step to get back to varnish again, for there are many manufacturers of wood products who would use varnish in preference to lacquer provided the drying time was shortened. Although lacquers increase output and shorten production time, yet there are some users who complain about the odor of lacquer while it is in use in production, whereas there is nothing disagreeable about the odor of fresh varnish.

It is quite possible that the drying time of varnishes will be shortened still more, and if this occurs many concerns will probably return to their "first love," varnish.—C. Dan Youngs.

A beautiful finish makes sure the first impression is in the manufacturer's favor.

new!

Economy Deluxe Sprayer

For the user of industrial spray equipment this new *Economy DeLuxe Sprayer* gives better application of any paint, varnish or lacquer. Combines high efficiency, simple operation and puts new life in the paint shop. Light in weight, does not clog, easily cleaned. There are many good reasons for the present popularity of Economy Spray Products PRICED: *DeLuxe Spray Gun—with material tube, cover, container, 25 feet air hose and connections and agitator . . . $32.00. Above without agitator . . . $30.00. DeLuxe Gun without any of above accessories . . . $22.00. 25 feet air hose with connections . . $4.50. 1 quart metal container without cover . . . $2.50.*

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MAXWEAR
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FORT WAYNE, IND.

Clean and Dry Metal Surfaces

The question recently arose as to which operation, or portion of operations, requires the most care and attention in the process of finishing metal parts or articles by tumbling, dipping or spraying; also to offer suggestions in regard to making this phase of the work more efficient and economical.

My answer to the first question is "Preparation!" In other words, get the job in proper shape first to receive the finish. If you neglect this part, what you do afterward counts for not much. After cleaning the surface properly, everything counts.

We all know or should know that paint, enamel or lacquer will not stay on top of a rusty or greasy surface, nor will the finish look right after being applied over rust. This holds good regardless of the manner of application—whether it is by dipping, spraying, tumbling, brushing, flocoing, stippling, stamping, marking, or any other way. So many important things enter into doing a job right that to add or detract any of the necessary requirements of each operation, will reflect itself on the others. For this reason I suggest *preparation* as the most important—provided each other course takes its proper route.

A surface imperfectly cleaned and then finished, or started through the finishing process, will give trouble sooner or later; it may begin to kick up right at the start. It follows then that the most efficient and economical way is the careful way.

Regardless of which way a surface is coated, I hold that wherever possible all work should be cleaned in gasoline or with cleaners advertised in INDUSTRIAL FINISHING, and then baked in the

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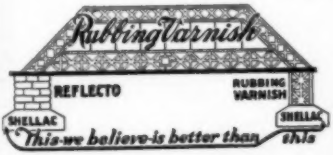

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raw at a temperature a few degrees higher than the hardest coat is to be baked. The more heat the better, but be careful of melting any solder that may be present, or of warping any thin metal by this preheating.

I suggest a light sanding or tumbling, if occasion demands but always a good dusting before applying the priming coat. Remove rust or scale also. Proceed carefully through each operation and your success is assured, barring accidents.—Fred Mannhardt.

Retail Sales Influenced By Color and Finish

The sale of many household utilities and appliances has been remarkably stimulated by finishing the appropriate surfaces in colors or in any one of a variety of attractive finish effects.

Look at any up-to-date woodenware display and you will see the results of this trend. Even the handle of the ordinary potato masher can be supplied in blue finish—glistening and wear resisting. Beaters, choppers and other kitchen utensils, commonly bought only for their strength and utility now offer the retailer some display features which he is glad to take advantage of.

One manufacturer explains it this way:

"We formerly supplied our kitchen woodenware—especially those items with handles—in the plain finish. Nobody thought that it made any difference since such stuff is bought for use and not for display. But the craze for colored kitchens and colored kitchen equipment to match made it good business to put in a finishing department. If this has added to the cost of production it also has added to our sales; and retailers

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We carry all shades of bronze powders for spraying, burnishing and striping.
Samples and prices submitted upon request
116-122 W. Illinois St.
Chicago

prefer the attractive items of this kind, even though their chief selling qualities are their strength and utility. It is merely a reaction to a public demand and we propose to meet it in every way possible."

Several hardware items—metal items—previously supplied in natural metal finish or with a dash of lacquer on the handle on certain parts—these are now being given modern finishes that make them stand out on the counters and in the windows. The handles of hammers and even hatchets and other tools are being finished with as much precision as is furniture. The artisian seems to appreciate a tool that looks attractive even though its surface attractions may become dimmed in service. And the colors are varied!—E. J. Clary.

Savings that have resulted directly from the co-operative services of the Department of Commerce, in aiding industry to eliminate waste, through simplification and standardization include vast savings in storage space, increased efficiency in manufacturing processes, as well as improved quality of product.

An article can be easily "over-finished"; sometimes the anxiety of the finisher to turn out an exceptional job means that much more time and effort are spent on the article than is necessary for its best appearance.

A certain finish featuring a particular color becomes, in time, valuable as a trade mark to identify your product, but in doing this take care that you do not ignore the power of variety in color and finish.

ever think about "HIGH BOILERS"

There are two good reasons for the use of the so-called "high boiling" solvents in lacquer formulation:

(1) To prevent "blush"
(2) To deposit a lacquer film of good gloss—a film that is free from "orange peel" effect and "sanding."

You will find by investigation and actual tests that

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2304 WESTMORELAND STREET, PHILADELPHIA
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Industrial Finishing

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

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Advertising rates on application.

EDITORIAL

Attractive Finish Sells More Utility Articles

Today, manufacturers of general miscellaneous merchandise are keeping abreast of the times by making even the smallest household article attractive in appearance, not because the finish contributes to its utility but because it boosts the sales. This trend has been clearly noticeable in hardware, house furnishings, notions and woodenware.

Probably the great strides that have been made in surfacing and finishing metal and wooden articles have had much to do with it. In any case, the hardware, notion, furnishings and woodenware counters of stores large and small now gleam with inexpensive and simple articles of utility that have been put through a finishing process of one kind or another.

One manufacturer of household utilities last year advertised his items in blue in the national magazines. He did it because no other competitive line is supplied in color finish and he wanted an identity for his advertised goods. This line quickly overtopped older established competitive lines largely because the dealer could see the outstanding attractions of the goods tied up with the blue finished parts in the big page advertisements.

The Lacquer Institute

Manufacturers of about 75 percent of the lacquer sold have formed a trade group for the purpose of securing the many advantages incident to joint study of the economics, manufacture and merchandising of lacquer products.

It is the purpose of the members of the Institute, to take advantage of the encouragement offered by Federal institutions such as the Department of Commerce and the Federal Trade Commission in the adoption of a Code of Business Practices that will have to do with the elimination of wasteful methods in manufacturing, selling and shipping the product, standardize containers and their use, study terms, discounts and allowances, promote open and fair competition, and prohibit misrepresentation as to uses and quality of lacquers.

The organization is along open and simple lines, is without penalties or restrictions and is to be mainly educational and suggestive.

An experienced trade association secretary has been engaged and well known legal counsel consulted. At the last meeting in New York, steps were taken to create a Code of Business Prac-

Our new Combination Uniforming Stain has revolutionized finishing of radio cabinets —

Eliminates three operations!

Stains and fills at the same time.

Fast to light ... supplied in various shades of either Walnut or Mahogany.

While this Combination Stain and Filler is being used by many of the world's largest manufacturers of radio cabinets, its use is by no means restricted to radio cabinets—it can be used on furniture, fixtures, and many other products.

Write today and let us tell you more about this sensational product.... and also about the complete process that is being used with this stain.

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"Hy-Speed" Mixing Tanks are built to mix lacquer . . . varnish ingredients . . . glues . . . colors . . . pastes . . . and other liquid materials.

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The fully-enclosed, vapor-proof motors are safe against all fire hazards in commercial use. Tanks are glass-lined for easy cleaning, and have a handy bottom outlet. Stock sizes 1 to 200 gal.

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"Hy-Speed" propeller action mixes top and bottom of the tank at the same time . . . blending colors, etc. in the shortest possible time.

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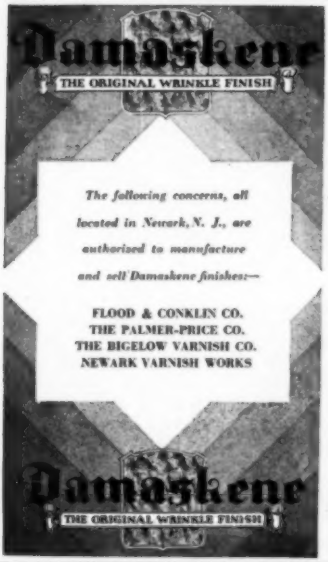
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We invite your inquiry. Write to Samuel H. French and Company, 400 Callowhill St., Philadelphia, Pa.

tices, among the provisions of which will be declarations supporting the sanctity of a fixed contract and the encouragement of fair and open merchandising methods, and against unfair discriminations, secret rebates and payment of unearned discounts and abuse of trade terms. An earnest effort will be made to keep both manufacturing and merchandising on a high plane and to prohibit misrepresentations concerning the product or purposes of any manufacturer.

It is contemplated that in the course of time plans will be adopted for the collection and distribution to the trade of accurate statistics, having to do with the volume of production and use of lacquer products, and to conduct such campaigns as are desirable to promote the use and service of the material by industrial advertising and other means.

A significant factor of potential importance in the functioning of the Institute is the benefit to customers, many of whom have expressed themselves strongly regarding the confusions now existing in the lacquer merchandising. Assurances of intelligent classification of products is greatly desired by the consumer.

The officers of the Lacquer Institute are Charles H. Reed, The Forbes Varnish Co., Chairman; A. W. Steudel, Sherwin-Williams Co., Vice-Chairman; W. C. Dabney, Jones-Dabney Co., and P. E. Kennedy, Murphy Varnish Co., additional members of the Executive Committee. Mr. H. B. Sweatt, 55 West 42nd Street, New York, is the Secretary and Treasurer, and McKercher & Link, of New York, are counsel.

Today we think in terms of combinations or decorative ensembles.

Here's What The GOOD Crown No. 12 Gun Does In Actual Performance!

Upon these facts you can accurately estimate what the **good** Crown No. 12 Gun will do for you . . . . and the profit you can make with it.

It sprays, for example:

1 Qt. of stain in 2 min. and 50 seconds!
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. . and it moves along at 110 yards an hour with entirely satisfactory results!

There's no need of guesswork when you use the Crown No. 12 . . . . and you'll find it delivers consistently day in and day out . . . . with all materials.

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Have opening for experienced man in formulation of baking japans. Man we require must be able to handle demonstrations and general service on our material. Good opportunity for capable man. Address IF-285, care Industrial Finishing.

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VOL. V

Industrial Finishing Magazine

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STABILISAL "A" is a material that has been used for several years in Europe as an addition to nitrocellulose bronze lacquers, to prevent their jellying and to minimize the tarnishing of the metallic bronze powder in the dried lacquer film. Polished metal surfaces, protected by a clear metal lacquer containing very small amounts of Stabilisal "A", will not tarnish.

The principal advantages in its use are the elimination of waste of lacquer due to jellying and thickening before using as well as an increased durability of the resulting finish.

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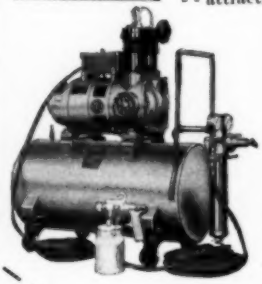

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suit any
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